Home
Registration
Talk and Poster Submissions
Travel
Valle d&#65533;Aosta
Lodging
Meals
Climate & Clothing
Activities
ASIC Format
Sessions
Speakers and Abstracts
Contact

.....

NEW -- Send in your registration form.

.....

ASIC 2009

Eighth Annual Summer Interdisciplinary Conference

Sarre, Valle d&#65533;Aosta, Italy
Wednesday, July 22 - Monday, July 27, 2009.

Announcing ASIC 2009

The Eighth Annual Summer Interdisciplinary Conference (ASIC 2009) will be held at the Etoile du Nord (http://www.etoiledunord.it/default_ENG.asp). Hotel du Nord is in Sarre, a few km west of Aosta, the main city in Valle d&#65533; Aosta, the large and spectacular valley where Italy, France and Switzerland meet. Aosta is a couple of hours drive west of Milan. Valle d&#65533; Aosta lies south of Mt. Blanc, southwest of Monte Rosa and the Matterhorn, and north of Gran Paradiso. Useful sites: http://www.regione.vda.it/turismo/default_e.asp; http://www.initaly.com/regions/valdsta/valdsta.htm.

Richard M. Shiffrin of Indiana University - Bloomington is the organizer: Email correspondence should be directed to or mailed to Richard M. Shiffrin at Indiana University (select 'Contact' from the menu for the address).

The subject matter of the ASIC conferences is interdisciplinary, within the broad frame of Cognitive Science. ASIC uses the very successful format of previous ASIC and AIC conferences: Days are free for leisure activities and discussions among participants. The talks/posters are in the later afternoon/early evening, followed by dinner. The date has been chosen to make it convenient for attendees to bring family/friends. In addition, the dates for 2009 make it convenient to combine ASIC with the Cognitive Science Society Conference and the Mathematical Psychology Conference to be held in that order successively in Amsterdam from July 29 - August 4. The conference is open to all interested parties, and an invitation is NOT needed to attend. However, due to the small number of spots for speakers, the organizer will select the attendees to give talks, and additional attendees will have the opportunity to present posters.

Previous Years' Websites

Several parts of this year's website are still under construction. For examples of previous years' websites, visit ASIC 2008, ASIC 2007, ASIC 2006 and ASIC 2005.

Invitation

The conference is open to all scholars who fit the very general theme of the conference, and their family and friends. An individual invitation is NOT needed. We encourage you to send the conference information to friends and colleagues. If you are interested in organizing a half or whole topic session, contact the organizer.

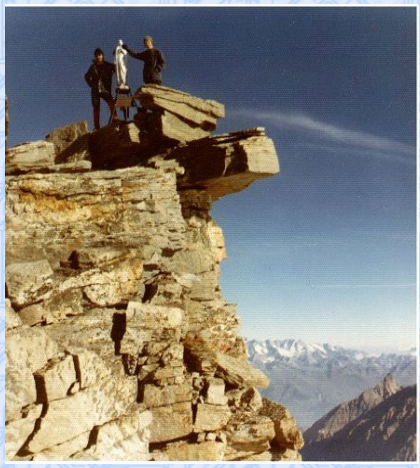
Conference Aims

The conference will cover a wide range of subjects in cognitive science, including:

- **modeling of cognition**
- **neuroscience, cognitive neuroscience**
- **psychology (including perception, psychophysics, attention, information processing, memory and cognition)**
- **computer science and artificial intelligence**
- **machine intelligence and learning**
- **methodology and statistics**
- **linguistics, psycholinguistics and computational linguistics**
- **philosophy of mind, cognitive science**

We especially invite talks emphasizing theory, mathematical modeling, and computational modeling (including neural networks and artificial intelligence). Nonetheless, we require talks that are comprehensible and interesting to a wide scientific audience. Speakers will provide overviews of current research areas, as well as of their own recent progress.

Conference Format



There is a single speaking session each day. If the number of participants exceeds the number of speaking slots (about 42), then the first half session on a day to be chosen will be devoted to posters. Information on submitting proposals for presentations (speaking or posters) is on the page of this website labeled 'Talk and Poster Submissions''. Please submit talk/poster information on the website, even if you have already sent (some of) this information to the organizer.

The conference will start with registration and a reception from 15:00-16:30 on Wednesday, July 22. On subsequent days (except a poster day) there will be drinks and light snacks from 16:15 - 16:30, followed by a session of seven spoken presentations that include a mid-session drink break. If there is a poster half session, drinks and snacks will be available throughout this period.

It will not escape the careful reader that this conference format frees most of the day for various activities with colleagues, family, and friends. We expect all scientific attendees and

participants to attend all sessions. The time frame will allow day trips to nearby sites, but arrange to return in time for the sessions. Travel to sites and planned activities from which a return for the session will not be possible by 16:15 should be arranged for days preceding and following the conference.

Registration

You are not officially on the request list for presenting research (talks or posters) until you send the registration fee, preferably by Paypal. visit the Registration page at this website.

Lodging

A block of rooms at Etoile du Nord are presently being held, but are limited (at the price negotiated), so reserve soon. For information visit the Lodging page at this website.

Home
Registration
Talk and Poster Submissions
Travel
Valle d'Aosta
Lodging
Meals
Climate & Clothing
Activities
ASIC Format
Sessions
Speakers and Abstracts
Contact

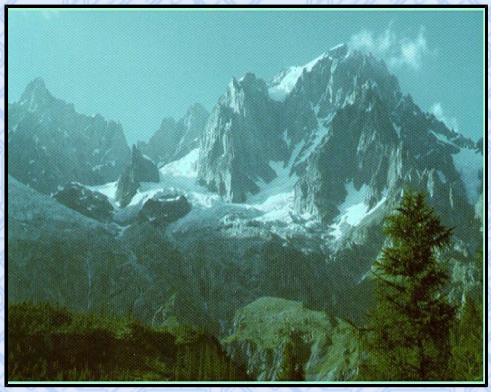
.....

NEW -- Send in your registration form.

.....

ASIC 2009

Eighth Annual Summer Interdisciplinary Conference



Registration Information for ASIC 2009

If you are planning to attend ASIC 2009, please fill out the registration form and submit your registration fee. This fee pays for room and equipment rentals, snacks, banquet, etc.

This year's fee schedule, in US dollars:

	By Check or PayPal in US dollars:
Prior to Jan. 1, 2009	$200
Jan. 1, 2009 - March 1, 2009	$260
After March 1, 2009	$320

In addition to the registration fee per person, you may purchase additional guest vouchers for other persons attending the opening reception and/or final banquet. All payments are calculated and paid by clicking on the 'register' link just below:

You need to register to calculate total payment for both payments option

1. **Online by PayPal (preferred).**
2. **Send a check for the correct amount to ASIC 2009, c/o Richard M. Shiffrin, Psychology Dept., Indiana University, Bloomington, IN 47405.**

ASIC 2009

Eighth Annual Summer Interdisciplinary Conference

Home

Registration

Talk and Poster Submissions

Travel

Valle d'Aosta

Lodging

Meals

Climate & Clothing

Activities

ASIC Format

Sessions

Speakers and Abstracts

Contact

.....

NEW -- Send in your registration form.

.....

Submissions of Talks and Posters

Whether you would prefer to give a talk or poster, and whether you have already sent some of this information to the organizer by email, please provide on the link below a list of authors (with the presenter indicated), their affiliations, and emails; a title, and an abstract (limit 250 words). These may be changed later, so do not hesitate to send them as early as possible. The organizer will use these to organize the sessions. Please go to the submission form to indicate your preference for talks or posters.

The spoken talks will most likely be limited to 30 minutes, a time that includes interruptions for questions, and final discussion. It would be best to plan for twenty minutes of actual speaking. The talks should be aimed not at specialists, but at a general scientific audience. Poster details will be provided later, should a poster session be required.

ASIC 2009

Eighth Annual Summer Interdisciplinary Conference

Home

Registration

Talk and Poster Submissions

Travel

Valle d'Aosta

Lodging

Meals

Climate & Clothing

Activities

ASIC Format

Sessions

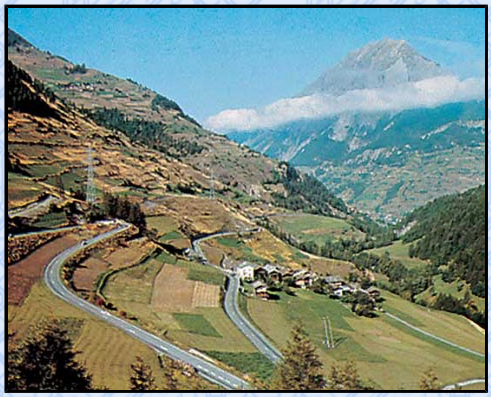
Speakers and Abstracts

Contact

.....

NEW -- Send in your registration form.

.....



Travel To and About SARRE (AOSTA)

Aosta lies in the northwest corner of Italy, where Italy meets France and Switzerland, in a large and spectacular valley, termed Valle d' Aosta. The Valle has 13 major side valleys, and lies south of the massif containing Mt. Blanc (n/nw), Monte Rosa (n), the Matterhorn (ne) and north of Gran Paradiso. A major superhighway, A5, runs west to Aosta from Milan. (The Mt. Blanc tunnel to Chamonix lies northwest of Aosta, and the St. Bernard tunnel to Switzerland kies north of Aosta).

The easiest access is by air through Milan (probably Malpensa airport which lies to the west of Milan, making it even easier to reach Aosta). Aosta is 168 km from Milan, but somewhat closer from Malpensa. For travel from Milan to Aosta there are rail links (via Chivasso), and bus links, but many attendees will probably rent autos. Once at the conference, autos will make it much more convenient to visit sites scattered around the large Valle d' Aosta. Note that there is an airport in Aosta (Corrado Rex), and other nearby airports include Turin (Caselle) 121 km, and Geneva (Cointrin) 151 km.

For those attendees going to Amsterdam after ASIC for the Cognitive Science and Mathematical Psychology conferences, flights from Milan are plentiful, but drives through the alps, even via the Mt. Blanc or St. Bernard tunnels, provide beautiful vistas. Driving distances to other cities include: Turin 114 km; Genoa 247 km; Chamonix, France (via Mt. Blanc Tunnel) 57 km; Martigny Switzerland (via Great St. Bernard Tunnel) 76 km; Amsterdam 1050 km; Geneva 134 km; Paris 668 km.

Home
Registration
Talk and Poster Submissions
Travel
Valle d'Aosta
Lodging
Meals
Climate & Clothing
Activities
ASIC Format
Sessions
Speakers and Abstracts
Contact

.....

NEW -- Send in your registration form.

.....

ASIC 2009

Eighth Annual Summer Interdisciplinary Conference

Valle d'Aosta Orientation:

The map given here will help orient the first time visitor:

The Valle D'Aosta region is made up of about 13 lateral valleys which extend off of the main valley. One enters the Valle d Aosta on A5 E25 (from Milan to the east and Torino to the southeast). Let us consider the valleys in order as one encounters them driving into the valley on the road A5 (also Rt 26) which goes through the Aosta Valley until it reaches the Mt Blanc Tunnel (to France and Chamonix). The road goes NW from Ivrea to Chatillon/St. Vincent and then roughly W to Morgex/St. Didier and then NW to Courmayeur and the Mt. Blanc (Mt. Bianco) tunnel. The elevations along the main road and valley floor rise from 224 m at Ivrea to about 500 m at Aosta and then more sharply to 1224 m at Courmayeur. There are high peaks surrounding the valley, the highest being Mt. Blanc (French)/Monte Bianco (Italian) at 4810 m. The 13 Valleys go either to the north or south of the main road (A5). After each valley name we give in parens whether the valley is to the north or south, the (very) approximate distance in km from Ivrea to the city at which one leaves A5, and the name of that city (Ivrea is about 100 km from Malpensa Airport). For each valley we give the highway or road number (if there is one) the approximate distance driving to the final destination in the valley, and the approximate location with respect to major mountains and tunnels. Some photographs are included to whet the appetite.

1. Gressoney Valley: (*North, 17 km, St. Martin*): Road 505 ends in 34 km at Gressony la trinite, south of Monte Rosa (4634m).

2. **Champorcher Valley**: (***South, 22 km***): A road leads about 15 km to Champorcher. Ends east of Monte Della (3186m)

3. **Ayas Valley**: (***North, 26 km, Verres***): Road 506 ends in 28 km at Champoluc/San Giocoma, south of Breithorn (4165m).

4. Valtournenche: (*North, 35 km, Chatillon, Saint Vincent*): Road 406 ends in 20 km at Cervinia (Monte Cervino), south of the Matterhorn (4478m).

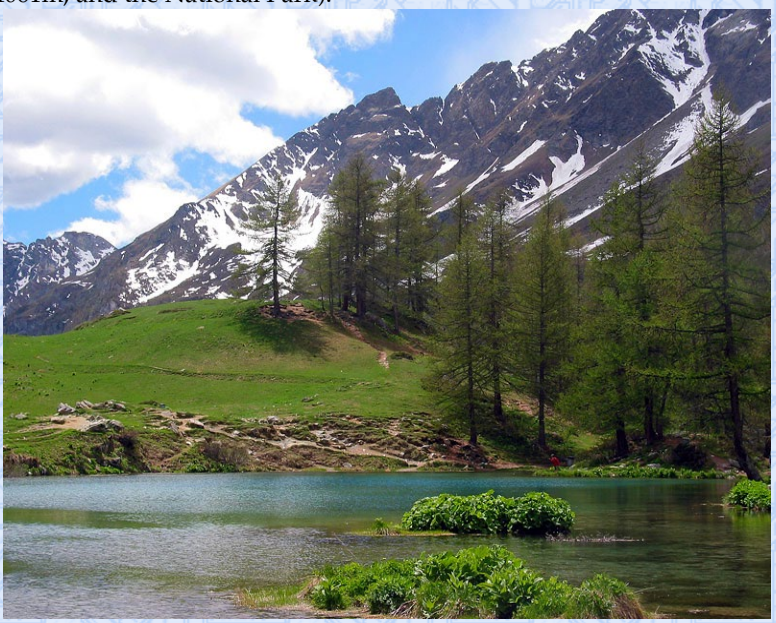
**Val Pelline and Great St. Bernard Valley: (*North, 68 km, Aosta*)

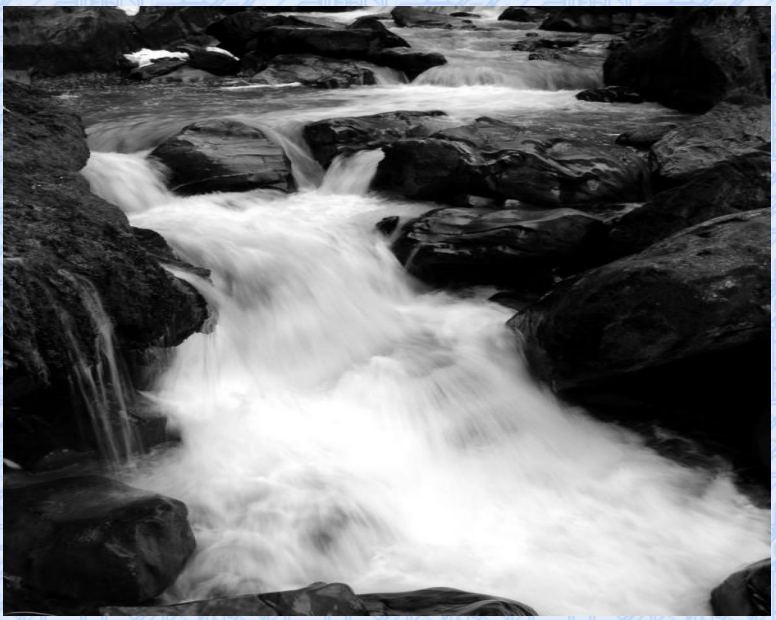
5. **Val Pelline**: 12 km N from Aosta to Valpelline and then NE 24 km to Prayayer. In the midst of a range of mountains from Matterhorn to the NE to Mt. Blanc de Cheilon (3795m) to the NW.

6. **Great St. Bernard Valley**: E27 and 27 lead from Aosta to the St Bernard tunnel to Switzerland (Martigny). The tunnel entrance is reached in about 23 km, to the SW of Grand Combin (4314m).
7. **Cogne Valley**: (***South, 70 km, Sarre***):Road 507 leads 24 km SE to Gollie, north of Gran San Pietro (3692m).

**Valsavarenche and Rhêmes Valley (*South, 73 km, Villeneuve*):

8. **Valsavarenche**: From Villeneuve head south 25 km to Gran Paradiso (4061m, and the National Park).





9. **Rhemes Valley**: From Villeneuve head S/Sw 23 km to Thumel, near Grande Traversiere (3496m).

10. **Valgrisenche**: (***South, 78 km***): Drive S/SW 18 km to Useleres, to the west of Grande Rousse (3607m).

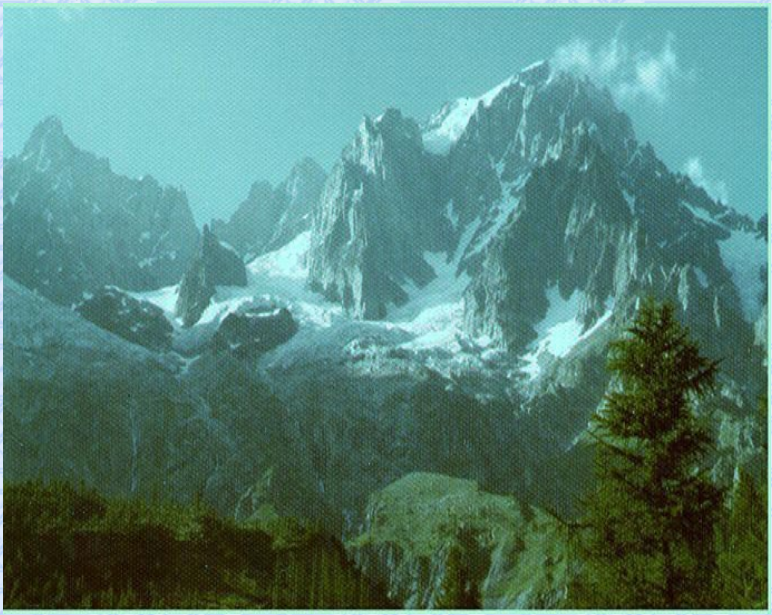
11. **Little St. Bernard Valley**: (***South, 99 km, St. Didier***): Old 26 and N90 head SW through and switchbacking over many mountains to the Little St. Bernard pass, to France.

****Val Ferret and Val Veny (Northwest, 110 km, Courmayeur)**:

The A5, E25, and SS26 Direct all lead on past Courmayeur to the Mt Blanc Tunnel, topped by Mt. Blanc (French) or Monte Bianco (Italian) (3782m).

12. **Val Ferret**: From Courmayeur drive NE 21 km to Refugio Elena, NE of

Grande Jorasses (4208m)



13. **Val Veny**: From Courmayeur drive SW 20 km to the lake and glaciers, below Auguille des Glaciers ((3816m).

You will note mention above (see 7. and 8.) of Gran Paradiso National Park. This park is famous for fauna and flora, and wonderful views.

ASIC 2009

Eighth Annual Summer Interdisciplinary Conference

Home

Registration

Talk and Poster Submissions

Travel

Valle d'Aosta

Lodging

Meals

Climate & Clothing

Activities

ASIC Format

Sessions

Speakers and Abstracts

Contact

.....

NEW -- Send in your registration form.

.....

Lodging

ASIC 2009 will be held at Etoile du Nord (http://www.etoiledunord.it/default_ENG.asp). We have placed a hold on 40 rooms. After Nov. 30, these may be released to the general public, so early reservations are essential. Bookings made late may still be offered at the conference rate (if any are available—if all are gone, lodging in other nearby hotels will be needed). It is safest to reserve early—full refunds of the deposit will be possible until March 1.

- **66 euros for two persons in a double room**
- **75 euros for two persons in a superior double room**
- **82 euros for one person in an economy room**
- **95 euros for one person in a standard room**
- **61 euros for three persons in a triple room**
- **54 euros for four persons in a quadruple room**
- **49 euros for five people in a quintuple room**
- **Children 0-4 years old free. Children 5-17 years old pay five euros less than the prices listed above.**

Booking requires a 20% deposit, and Lodging reservations should be made early. Bookings can be made by email at or by fax at +39.030.3758444. An initial deposit of 20% is required at booking.

ASIC 2009

Eighth Annual Summer Interdisciplinary Conference

Home

Registration

Talk and Poster Submissions

Travel

Valle d'Aosta

Lodging

Meals

Climate & Clothing

Activities

ASIC Format

Sessions

Speakers and Abstracts

Contact

.....

NEW -- Send in your registration form.

.....

Food/Dining

The meals will be taken at the dining hall at Etoile du Nord.

Breakfast and buffet dinner are included as part of the lodging charges for all attendees and guests at Hotel du Nord. Lunches can be taken, as desired, either at the hotel or at many restaurants in town. Lunches to go, for various outings, can also be arranged.

The dining will be buffet style, and a variety of dining options has been arranged, including vegetarian meals (not just salads). There will a banquet dinner at the hotel to end the conference, including wine and beer.

The food and drink offerings at the opening reception, the session starts, the mid-session breaks, and a supplement for the opening reception and final banquet are paid for from the participants' registration fees.

Breakfasts are continental style and include bread, biscuits, croissants, jam, honey, butter, cereals, sliced cheese, yogurt, sliced salami, orange juice, milk, coffee, tea. [For those wanting eggs and omelettes, there will an additional charge of € 5 per day].

ASIC 2009

Eighth Annual Summer Interdisciplinary Conference

- Home
- Registration
- Talk and Poster Submissions
- Travel
- Valle d'Aosta
- Lodging
- Meals
- Climate & Clothing
- Activities
- ASIC Format
- Sessions
- Speakers and Abstracts
- Contact

.....

NEW -- Send in your registration form.

.....

Climate, Weather, Clothing

The weather in Valle d' Aosta in late July tends to be quite pleasant generally dry and warm to hot in the days, and cool at night. Temperatures and conditions of course vary with altitude Sarre is about 1700 feet in elevation and the mountains top out at about 15,000 feet. On outings, especially to the mountains, one should be prepared accordingly. Do not forget sun cream. Biting insects do not seem to be much of a problem. For various adventure outings, specialty clothing may of course be needed (see the link on this website to ACTIVITIES.

Home
Registration
Talk and Poster Submissions
Travel
Valle d'Aosta
Lodging
Meals
Climate & Clothing
Activities
ASIC Format
Sessions
Speakers and Abstracts
Contact

.....

NEW -- Send in your registration form.

.....

ASIC 2009

Eighth Annual Summer Interdisciplinary Conference

Activities

A very useful resource is the website: http://www.regione.vda.it/turismo/default_e.asp

(Click Eng at the top if you are given the Italian version.)

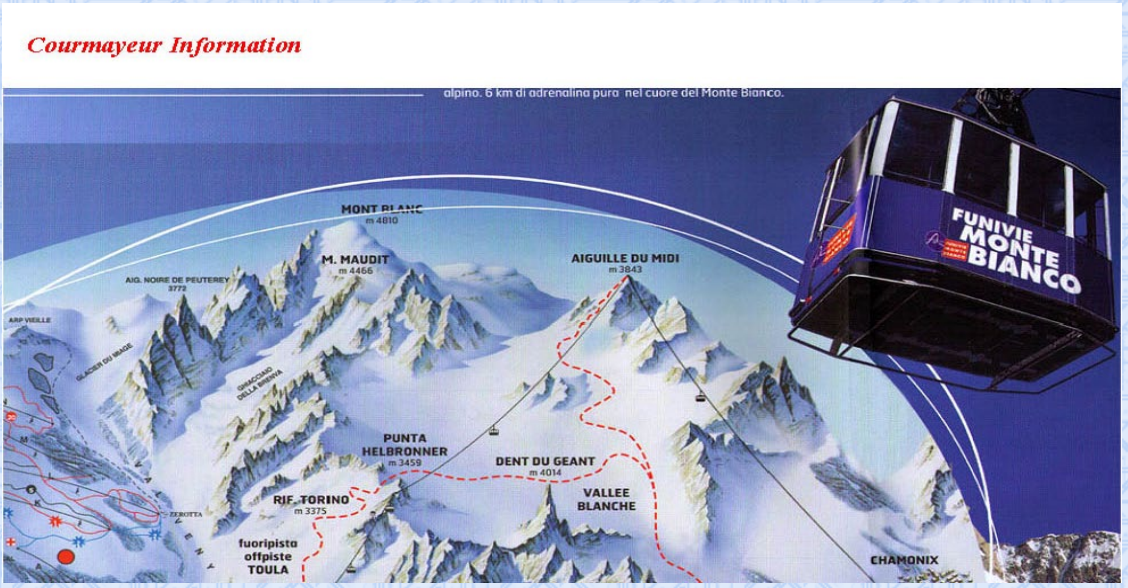
One can also try: http://www.regione.vda.it/default_f.asp

I invite you to explore this extensive website at leisure. Eventually we may add more specific information here, but for now the websites above give more than sufficient information about all aspects of the region and activities.

For some pictures about scenes available in the various Aosta side valleys, see the Travel Page on this website.

For the adventure and leisure minded, I note that the available activities, either self guided or available as tours with guides, include:

Cable Car tour up and over the Mt Blanc Massif to Chamonix :



Hiking:
Let me note that the website lists and describes (with maps) approximately 338 walks (not counting the many multiday treks possible).

Via Ferrata

Rock Climbing

Mountaineering

Bicycling and Mountain Biking

Rafting

Kayaking

Fishing

Swimming

Parapenting

Canyoning

Summer Skiing

Golf

Horse Riding

Adventure Parks

Hot Air Ballooning

For rock climbing, let me refer the reader to: http://www.worldtopo.com/masreg.php?regn=238 This site describes about 50 or so rock climbing areas in the Aosta Valley.

For culture, the region is replete with old castles, museums, and historical sites. There are also many events. The website lists many such possibilities.

ASIC 2009

Eighth Annual Summer Interdisciplinary Conference

Home

Registration

Talk and Poster Submissions

Travel

Valle d'Aosta

Lodging

Meals

Climate & Clothing

Activities

ASIC Format

Sessions

Speakers and Abstracts

Contact

.....

NEW -- Send in your registration form.

.....

Schedule

There will be a single speaking session each day, from Wednesday through Monday, with seven talks, unless a poster session is needed, in which case a first half session one day will be devoted to posters. Information on submitting proposals for presentations (speaking or posters) is on the page of this website labeled 'Talk and Poster Submissions". Please submit talk/poster information on the website, even if you have already sent (some of) this information to the organizer.

The conference will start with registration and a reception from 15:00-16:30 on Wednesday, July 22. On subsequent days there will be drinks and light snacks from 16:15 - 16:30, followed by a session of seven spoken presentations that include a mid-session drink break.

Following the sessions, there will be a buffet dinner at the hotel. Dinner on the last night, Monday, July 27, will be a banquet, with wine and beer included.

Home
Registration
Talk and Poster Submissions
Travel
Valle d'Aosta
Lodging
Meals
Climate & Clothing
Activities
ASIC Format
Sessions
Speakers and Abstracts
Contact

.....

NEW -- Send in your registration form.

.....

ASIC 2009

Eighth Annual Summer Interdisciplinary Conference

Sessions

ASIC 2009 Tentative Schedule

(Note: Speaker order within session to be chosen later)
For tentative timing, breaks, and meals, see "ASIC Format"

Wednesday, July 22: Memory Symposium -- Chair: Steve Lewandowski

Lewandowski, Steve -- *Working Memory and Categorization*
Camos, Valerie and Barrouillet, Pierre – *Time Based Resource Sharing*
Oberauer, Klaus – *Complex Span and Time Based Resource Sharing*
Brown, Gordon – *Expanding Ratio Models of Memory*
Dunn, John – *Tests of 2-D Models of Source Memory*
Criss, Amy – *Linking Diffusion Models to Memory Models*
Murdock, Ben – *TODAM Working Memory Model for Short-term Serial Memory*

Thursday, July 23: Vision and Perception – Chair: George Sperling

Wade, Alex – *Population Coding in Early Vision*
Pouget, Alex – *Inference in Population Coding with Divisive Normalization*
Sperling, George, et al – *Windsurfers and Runways: Analysis of an Illusion*
Davelaar, Eddy – *Sequential Effects in Flanker Tasks*
Cowell, Rosie – *Virtual Brain Reading: Connectionist Analysis of fMRI*
Bavelier, Daphne – *Action Video Game Playing as a Perceptual Learning Tool*
Neumann, Ewald – *Working Memory and Visual Attention*

Friday, July 24: Bayes meets Cog Sci Symposium – Chair: Noah Goodman

Goodman, Noah – *Non Modularity of the Bayesian Mind*
Vul, Ed – *Bayesian Inference Based on Limited Sampling*
Tenenbaum, Josh – *Bayesian Models of Object Tracking in Human Adults and Infants*
Shiffrin, Richard – *Bayesian Hierarchical Modeling of Function Estimation*
Kalish, Mike – *Bayesian Hierarchical Modeling of Function Learning*
Lee, Mike – *Bayesian Analyses of Diffusion Models*
Brown, Scott – *Bayesian Analyses of Hick's Law*

Saturday. July 25: Poster Session plus Cognitive Science
Poster Session

Chambaron, Stephanie, et al –
1) *Pace and Time in Sequence Learning*
2) *Implicit Learning in Serial RT and Continuous Tracking (and fMRI?)*
Hemmer, Pernille – *The Influence of Prior Knowledge on Memory for Scenes*
Eidels, Ami – *Modeling of Aging and Workload Capacity*
Bailey, Charles – *Matching Language and Cognition with the Natural World*
Burns, Devin – *Facial Perception as a Configural Process*
Dietz, Kristina, et al – *Mirror Effects in a Modified Directed Forgetting Procedure (Item-method)*
Hotaling, Jared – *Information Integration in Perceptual Decision Making*
Kachergis, George – *Modeling Frequency and Context Effects in Statistical Learning*

Cognitive Science: Chair: Dave Huber

McKoon, Gail, & Ratcliff, Roger – *RT Slowing with Age—a Diffusion Analysis*

Vandekerckhove, Joachim, et al – ***Diffusion Analysis of Semantic Categorization***
Huber, Dave et al – ***Behavioral and Electrophysiological Studies of Semantic Satiation***

Sunday, July 26: Outstanding Science; Chair: Axel Cleeremans

Consciousness

Cleeremans, Axel, et al – ***Learning to be Conscious: A Model of Awareness***
Kouider, Sid – ***Neural and Behavioral Bases of Awareness in Prelinguistic Infants***
Jerome Sackur – ***Conscious access and categorical processing***

Word Learning

Sloutsky, Vladimir – ***Learning Words from Context: Early Word Learning***

Sentence Representation

Frank, Stefan – ***A Syntax-free Account of Syntactic Effects on Reading Time***

Heuristics

Katsikopoulos, Konstantino – ***Signal Detection Analysis of the Less-is-More Effect***

Monday, July 27: Excellent Science – Chair: Brad Love

Categorization

Love, Brad et al – ***The Concrete Substrates of Seemingly Abstract Behaviors***
Jones, Matt – ***Selective attention in Category Learning and Reinforcement Learning***

Methodology and Bayes

Heathcote, Andrew – ***Bayesian Analysis of Memory Retention***
French, Bob – ***The Perils of Constrained Randomization***

Robotics

Schneider, Werner et al – ***Humans and Humanoids: on Cognitive Science***
Simsek, Ozgur – ***Behavioral Building Blocks for Autonomous Agents***

Home
Registration
Talk and Poster Submissions
Travel
Valle d'Aosta
Lodging
Meals
Climate & Clothing
Activities
ASIC Format
Sessions
Speakers and Abstracts
Contact

.....

NEW -- Send in your registration form.

.....

ASIC 2009

Eighth Annual Summer Interdisciplinary Conference

Authors, Titles, Abstracts

(When sufficient titles, and abstracts for talks and posters arrive, I will begin posting them in this section)

Alphabetical listing by speaker

A | B | C | D | E | F | G | H | I | J | K | L | M | N | O
P | Q | R | S | T | U | V | W | X | Y | Z

B

Speaker's Name: Charles E. Bailey
First Author's Name: Charles E. Bailey
First Author's Affiliation: Executive Director, Global Institute for Scientific Thinking, Inc.

Title: Matching Language and Cognition with the Natural World

Abstract: This paper examines the challenges of accurately understanding the relationship between human language, human behavior, and natural world reality. The relationship will be explored with corollaries that define a functional relationship connecting usage-based language theories, cognitive neuroscience, computer science, complexity theory, and the physical world. This paper contends that this functional relationship applies to cognition and can best be understood with a reference point based on cognitive accuracy, i.e. information accuracy, information processing accuracy, and event-level accuracy. For this purpose, accuracy is defined as achieving the narrowest possible difference between probabilistic assumptions and predictions and some external, predetermined reference point based on reliable knowledge and relative cause and effect observation. Cognitive accuracy provides theoretical idealized global optima for identifying and evaluating deviations in accuracy. More optimal solutions will more likely be achieved when the environment (domain space) is accurately defined, policies and information are accurately processed, and the relevant and available feedback is accurately accounted for. Appropriately matching language to observed external natural phenomena can enable humans to apply the same kind accuracy to their own behavior, and to the natural world around them. Using such a natural reference point can also establish a functional optimum for reliably and more accurately evaluating human interactions within a dynamic uncertain (probabilistic) environment, i.e., the natural world represented as accurately as possible. This evaluation relies on and supports the benefits of obtaining conclusions and solutions as accurately, effectively, adaptively, and robustly as possible.

Speaker's Name: Daphne Bavelier

First Author's Name:	Daphne Bavelier
First Author's Affiliation:	University of Rochester, Rochester NY
Title:	Action video game playing as a learning tool
Abstract:	Although the adult brain is far from being fixed, the types of experience that promote learning and brain plasticity in adulthood are still poorly understood. Surprisingly, the very act of playing action video games appear to lead to widespread enhancements in visual skills in young adults. Action video game players have been shown to outperform their non-action-game playing peers on a variety of sensory and attentional tasks. They search for a target in a cluttered environment more efficiently, are able to track more objects at once and process rapidly fleeting images more accurately. This performance difference has also been noted in choice reaction time tasks with video game players manifesting a large decrease in reaction time as compared to their non-action-game playing peers. A common mechanism may be at the source of this wide range of skill improvement. In particular, improvement in performance following action video game play can be captured by more efficient integration of sensory information, or in other words, a more faithful Bayesian inference step, suggesting that action gamers may have learned to learn.

Speaker's Name:	Heather Berlin
First Author's Name:	Heather Berlin
First Author's Affiliation:	Mount Sinai School of Medicine
Title:	The Prefrontal Cortex, Impulse Control, and Emotion Regulation
Abstract:	I will discuss my research on the functions of the orbitofrontal and dorsolateral prefrontal cortex (including learning and alteration of stimulus-reinforcement associations; emotional processing; decision-making; time perception; and working memory) and their relation to psychiatric illness. Further, I am examining whether the same mechanisms involved in response inhibition and emotion regulation are also involved in suppression of memories, by testing impulse control and dissociative disorder patients with directed forgetting, working memory, and time perception tasks. Results from this work should encourage clinicians to take a dimensional approach to psychopathology, not classifying patients as having a "disorder" per se, but as differing from the "normal" population on certain dimensions, like impulsivity or emotion regulation. Accordingly, treatment should be targeted at these dimensions, and the brain mechanisms related to them, rather than the "disorder". A clearer understanding of the neural basis of impulsivity and emotion regulation will lead to the development of more effective and targeted treatments for psychiatric illness.

Speaker's Name:	Gordon D. A. Brown
First Author's Name:	Gordon D. A. Brown
First Author's Affiliation:	University of Warwick
Title:	Extending Ratio Models of Memory
Abstract:	A number of human memory phenomena appear similar over a wide range of timescales, and the same is true for some aspects of learning in non-human animals. I review some of

these effects, and discuss classes of model that hold promise for accounting for such data. In particular we explore the possibility that the same type of model architecture might account for conditioning phenomena as well as human episodic memory. More specifically, I show how an extended version of a temporal ratio model can account for some rehearsal phenomena in free recall as well as some of the results that appear similar over a wide range of timescales.

Speaker's Name: Scott Brown
First Author's Name: Scott Brown
First Author's Affiliation: University of Newcastle, Australia
Second Author's Name: E.J. Wagenmakers
Second Author's Affiliation: U van Amsterdam, the Netherlands
Third Author's Name: Mark Steyvers
Title: Bayesian and Heuristic Models for Multi-Choice Tasks, with Application to Hick's Law Data.
Abstract: Most decision-making research has focused on choices between two alternatives. For choices between many alternatives, the primary result is Hick's Law - that mean response time increases logarithmically with the number of alternatives. Various models for this result exist within specific paradigms, and there are some more general theoretical results, but none of those have been tested stringently against data. We present an experimental paradigm that supports more detailed examination of multi-choice data, and analyse predictions from a Bayesian ideal-observer model for this paradigm. Data from the experiment deviate from the predictions of the Bayesian model in interesting ways. A simple heuristic model based on evidence accumulation provides a good account for the data, and has attractive properties as a limit case of the Bayesian model.

Speaker's Name: Devin Burns
First Author's Name: Devin Burns
First Author's Affiliation: Indiana University
Second Author's Name: Lei Pei
Second Author's Affiliation: Indiana University
Third Author's Name: Joseph Houpt
Third Author's Affiliation: Indiana University
Fourth Author's Name: James Townsend
Fourth Author's Affiliation: Indiana University
Title: Facial Perception as a Configural Process
Abstract: Configural or gestalt processing are general terms given to phenomena where the whole is different from the sum of its parts. Here we explore these phenomena through face perception, a known configural process. In this experiment, subjects are presented with a split face recognition task with manipulations on the presence or absence and the salience of each half, the famous composite face design. It is one of a number of perceptual experimental designs based on selective attention and the presence or absence of interference expressed in RT or accuracy. We performed a replication of this task and then added a design based on divided attention. Systems factorial technology is employed to draw conclusions regarding architecture, stopping rule, capacity and

independence.

C

Speaker's Name:	Val&#65533;rie Camos
First Author's Name:	Val&#65533;rie Camos
First Author's Affiliation:	Universit&#65533; de Bougogne & Institut Universitaire de France
Second Author's Name:	Pierre Barrouillet
Second Author's Affiliation:	Universit&#65533; de Gen&#65533;ve
Title:	Time and Cognitive Load within the Time-Based Resource-Sharing model
Abstract:	According to the Time-Based Resource-Sharing model (Barrouillet, Bernardin, & Camos, 2004), the cognitive load a given task involves is a function of the proportion of time during which it captures attention, thus impeding other attention demanding processes to take place. Accordingly, we present studies demonstrating that the disruptive effect of memory retrievals and response selections on the maintenance of verbal information increases with their duration. These effects are not modality specific, as spatial processing was found to disrupt verbal maintenance. Moreover, the effect on recall performance of concurrent activities does not go beyond their duration in so far as the processes are attention demanding. We demonstrated that concurrent retrievals from long-term memory or spatial response selections have the same the effect on verbal maintenance when their durations are equated. By contrast, activities that do not solicit central processes for a sizable portion of time have no measurable impact on span. These results suggest a sequential and time-based functioning of working memory in which processing and storage rely on a single and general purpose attentional resource needed to run executive processes devoted to construct, maintain and modify ephemeral representations.

Speaker's Name:	St&#65533;phanie Chambaron
First Author's Name:	St&#65533;phanie Chambaron
First Author's Affiliation:	CO3 - Universite Libre de Bruxelles
Second Author's Name:	Dominique Ginhac
Second Author's Affiliation:	LE2I - Universite de Bourgogne
Third Author's Name:	Antoine Pasquali
Third Author's Affiliation:	CO3 - Universite Libre de Bruxelles
Fourth Author's Name:	Arnaud Destrebecqz
Fourth Author's Affiliation:	CO3 - Universite Libre de Bruxelles
Fifth Author's Name:	Axel Cleeremans
Fifth Author's Affiliation:	CO3 - Universite Libre de Bruxelles
Title:	The role of pace and time in sequence learning: what is the impact of RSI variations on learning?
Abstract:	In the present study, we investigated the role of the pace of the learning task on sequence learning in a serial reaction time (SRT) task by manipulating the value of the response-stimulus interval (RSI). We assumed that a variable RSI would interfere with chunk formation during training and would have a detrimental effect on learning. To test this hypothesis, we conducted a series of four experiments in which we compared sequence learning in variable and

constant RSI conditions. In the first two experiments, the average value of the RSI could be either short (Experiment 1) or long (Experiment 2). In Experiment 3, participants were trained with constant RSIs (either short or long) and subsequently tested with variable RSIs in a recognition task. Experiment 4 reversed this design. Previous studies indicate that longer RSIs improve explicit learning (Destrebecqz & Cleeremans, 2001, 2003; Miyawaki, 2006). In contrast, our results suggest that participants learned the sequence regardless of the duration or of the constant vs. variable nature of the RSI. Recognition of sequence fragments, however, was only observed when the RSI was constant at test. We suggest that temporal organization of the sequence is mandatory for recognition, but not for sequence learning to take place.

Speaker's Name: St&#65533;phanie Chambaron
First Author's Name: St&#65533;phanie Chambaron
First Author's Affiliation: CO3 - Universite Libre de Bruxelles
Second Author's Name: Nathalie Berg
Second Author's Affiliation: CO3 - Universite Libre de Bruxelles
Third Author's Name: Dominique Ginhac
Third Author's Affiliation: LEA2I - Universite de de Bourgogne
Fourth Author's Name: Philippe Peigneux
Fourth Author's Affiliation: UR2NF - Universite Libre de Bruxelles
Title: Learning discrete and continuous regularities in two-dimensional settings: Towards a functional neuroimaging investigations.

Abstract: Chambaron and collaborators previously disclosed that despite robust implicit learning in Serial Reaction Time (SRT) tasks [1], subjects cannot implicitly learn the displacement regularities embedded in a continuous tracking task [2], in which the target moved along the horizontal dimension. However, this latter result was contradictory with positive learning results obtained using a two-dimensional tracking task [3]. To investigate further this issue, we have attempted to test subjects in SRT and continuous tracking conditions using a strictly similar material, in which the target trajectory (tracking) or stimuli moves (SRT) were predictable on the horizontal axis but random on the vertical axis. Participants were randomly assigned to the SRT (N=16) or the Tracking (N=16) condition. In both cases, they performed with their non-dominant hand. First, they practiced the allotted task for 14 blocks using the same regularity pattern, but Block 12 (transfer) in which a different regularity was proposed. At the test phase, they practiced again 4 blocks composed of a training, a transfer and two training blocks, followed by a recognition test. Results disclose significant learning both in discrete and continuous conditions, with similar performances patterns. These data indicate that sequential regularities can be efficiently learn with practice both in discrete and continuous data presentation conditions, at least when using a 2D material. Functional neuroimaging investigations are actually in progress to complete these behavioral data.

Speaker's Name: Axel Cleeremans

First Author's Name: Axel Cleeremans
First Author's Affiliation: Universit&#65533; Libre de Bruxelles
Second Author's Name: Antoine Pasquali
Second Author's Affiliation: Universit&#65533; Libre de Bruxelles
Third Author's Name: Bert Timmermans
Third Author's Affiliation: Universit&#65533; Libre de Bruxelles
Title: Learning to be conscious: A metacognitive model of awareness

Abstract: Subjective measures of awareness rest on the assumption that conscious knowledge is knowledge that participants know they possess. Post-decision wagering, recently proposed as a new measure of awareness, requires participants to place a high or a low wager on their decisions (e.g., stimulus identification in a perceptual task, string classification in an artificial grammar learning task, deck selection in the Iowa gambling task). Whereas advantageous wagering indicates confidence in the knowledge on which the decisions are based, cases in which participants fail to optimize their wagers suggest performance without awareness. Here, we hypothesize that wagering and similar subjective measures of awareness reflect metacognitive capacities subtended by self-developed metarepresentations that inform an agent about its own internal states. To support this idea, we present three simulation studies in which neural networks learn to wager on their own performance. Results demonstrate a good fit to human data. We discuss the implications of this modeling work for our understanding of consciousness.

Speaker's Name: Rosie Cowell
First Author's Name: Rosie Cowell
First Author's Affiliation: University of Kent Canterbury
Second Author's Name: Cowell R.A.
Second Author's Affiliation: N/A
Third Author's Name: Huber D.E.
Third Author's Affiliation: N/A
Fourth Author's Name: Cottrell G.W.
Fourth Author's Affiliation: N/A
Title: Virtual Brain Reading: A Connectionist Approach to Understanding fMRI

Abstract: We present a neurocomputational model of visual object processing, which takes real photographic inputs and creates topographic stimulus representations on the hidden layer. We performed multi-voxel pattern analysis on the activations of hidden units in the model, in the same way that activations across voxels are analyzed in fMRI experiments. We simulated contradictory findings from Haxby et al. (2001) and Spiridon and Kanwisher (2002) within a single model. With no special processing mechanism or architecture for faces in our model, we obtained the same results as Spiridon & Kanwisher, who interpreted these as evidence for a &#65533;face module&#65533; &#65533; something our model does not possess.

Speaker's Name: Amy H. Criss
First Author's Name: Amy H. Criss
First Author's Affiliation: Department of Psychology Syracuse University

Title:	Linking diffussion modeling to memory models
Abstract:	In differentiation models, the processes of encoding and retrieval produce an increase in the target distribution and a decrease in the foil distribution as the amount of encoding increases. This produces an increase in the hit rate and decrease in the false alarm rate for a strongly encoded compared to a weakly encoded list, consistent with empirical data. Other models assume that the foil distribution is unaffected by encoding manipulations or the foil distribution increases as a function of target strength. They account for the empirical data by adopting a stricter criterion for strongly encoded lists relative to weakly encoded lists. The differentiation and criterion shift explanations have been difficult to discriminate using accuracy measures. In this paper reaction time distributions and accuracy measures are collected in a list strength paradigm and in a response bias paradigm where the proportion of test items that are targets was manipulated. Diffusion model analyses showed that list strength affects the rate of accumulation of evidence (e.g., drift rate) for both targets and foils but not response bias (e.g., starting point). Manipulating the proportion of targets affects response bias but not the accumulation of evidence. The diffusion model analyses is consistent with a priori predictions of the differentiation models where subjective memory strength is mapped directly onto drift rate and criterion placement is mapped onto starting point. Criterion shift models require ad hoc assumptions to account for these findings.

D

Speaker's Name:	Eddy Davelaar
First Author's Name:	Eddy Davelaar
First Author's Affiliation:	Birkbeck, University of London
Title:	Sequential effects in the Eriksen flanker task: a thorough investigation
Abstract:	I will present a series of experiments addressing the debate on locus of sequential effects in the Eriksen flanker task. One view is that sequential effects are due to modulation of spatial attention following the detection of response conflict. A second view is that sequential effects are due to learning stimulus-response mapping, which also underlies practice effects. I will show that the data is explained much more readily using stimulus-response learning than using modulation of spatial attention. I will show more detailed behavioral analyses that put the debate at a level beyond theory comparison. These findings suggest that published data that have been used to infer deficits in cognitive control in group analyses or differential contributions of brain areas to cognitive control may be reinterpreted as showing deficits in or differential susceptibility to automatization. The experiments are sufficiently rich that it is possible to account for most, if not all, datapoints in the original data set. Although this requires a new set of assumptions, each of these has been or is currently being tested independently in dedicated experiments.

Speaker's Name:	Kristina Charlotte Dietz
First Author's Name:	Kristina Charlotte Dietz

First Author's Affiliation: University of Kent, Canterbury, UK
Second Author's Name: Johanna Catharina van Hooff
Second Author's Affiliation: University of Kent, Canterbury, UK
Third Author's Name: Howard Bowman
Third Author's Affiliation: University of Kent, Canterbury, UK
Title: Mirror effects in a modified directed forgetting procedure (item-method)

Abstract: Directed forgetting procedures are used to study the mechanisms that prevent irrelevant or outdated information from affecting memory-based decisions. In item-method directed forgetting, each presented item in the study phase is followed by a delayed cue to indicate whether the item is to be remembered (TBR) or to be forgotten (TBF). At test, recognition is consistently less accurate for TBF-items than for TBR-items. This effect is generally attributed to encoding differences, although it is debated whether processing of TBF-items ceases post-cue (so that their memory traces passively decay) or whether TBF-items become actively inhibited. The attribution of item-method directed forgetting effects to encoding differences has implications for new items presented at test in terms of behavioural performance and electrophysiological responses. We assessed these by modifying the test phase of the experimental procedure: New words were once blocked with TBR-cued old words (creating a remember retrieval context) and once with TBF-cued old words (creating a forget retrieval context). Data from two behavioural and one event-related potential (ERP) study showed simultaneous increases in correct responses to new and old items in the remember retrieval context (mirror effects) as well as a modulation of an N400-like ERP waveform. We interpreted the latter as indexing changes in retrieval processing, more specifically, as changes in processing emphasis on perceptual vs. semantic features. Taken together, data suggests that the observed mirror effect was not based on a shift in response criterion (Type I), but on a separation of the underlying old and new distributions (Type II).

Speaker's Name: John Dunn
First Author's Name: John Dunn
First Author's Affiliation: University of Adelaide
Second Author's Name: Nicholas Hamm
Second Author's Affiliation: University of Adelaide
Title: Source memory: Test of a two-dimensional signal detection model.

Abstract: Recently, Hautus and colleagues have proposed a complete decision model of item and source recognition based on a two-dimensional signal detection framework which they fit to three existing databases (M. J. Hautus, N. A. Macmillan & C. M. Rotello, Psychonomic Bulletin & Review, 15(5), 889-905). This model implies that it should be possible to differentially manipulate item memory and source memory strength. In order to evaluate this question, we examined source and item memory in response to variation in two factors: item strength (number of study presentations) and selective attention (focused vs. divided attention at study). We collected confidence ratings and looked for evidence of differential

effects on item and source memory using state trace analysis. We observed no systematic departure from a unidimensional state trace indicating that the effects of the independent variable on source and item memory were mediated by a common, single, parameter. Implications of these findings for the two-dimensional signal detection model and alternative dual process models are discussed.

E

Speaker's Name:	Ami Eidels
First Author's Name:	Ami Eidels
First Author's Affiliation:	University of Newcastle, Australia
Second Author's Name:	Boaz Ben David
Second Author's Affiliation:	University of Toronto
Title:	Aging and Workload Capacity: Do older adults integrate visual stimuli differently than younger adults?
Abstract:	We investigate the effect of aging on response times and on the processing capacity of redundant-visual signals. In the redundant target design, an observer detects the presence of a target. A trial can include two (redundant), single, or no-targets. A new approach to capacity (Townsend & Nozawa, 1995) compares the processing of single- and redundant-target trials to compute an index of workload capacity. We compared target-detection latencies and Townsend's capacity for younger- and older-adults and examined the effects of distractor presence and absence for both groups.

F

Speaker's Name:	Stefan Frank
First Author's Name:	Stefan Frank
First Author's Affiliation:	University of Amsterdam
Title:	A Syntax-free Account of Syntactic Effects on Reading Time
Abstract:	It has been argued (Levy, 2008) that the time needed to read a word in sentence context is positively related to its 'surprisal', which is the negative logarithm of the word's probability given the sentence's previous words. Word surprisal can be estimated by probabilistic models of syntax (i.e., models that embody knowledge of sentence forms) such as grammars, neural networks, and Markov models. Indeed, all of those have been shown to estimate surprisal values that correlate with reading times. However, surprisal can also be defined with respect to knowledge of the world, that is, without any reference to syntax. In that case, the probability of an assertion equals the probability that the asserted proposition is true. The model by Frank, Haselager, & Van Rooij (2009) simulates sentence comprehension as the word-by-word transformation of a sentence into a representation of the situation described by the sentence. The model comes with a complete description of a simple microworld, as well as a microlanguage in which the microworld's situations can be described. These are all the necessary ingredients for independent definitions of a word's 'syntactic surprisal' (based on probabilities of sentence forms) and its 'semantic surprisal' (based on probabilities of microworld situations). I will present a simple dynamic extension of the Frank et al. model in which the processing time for a word depends only on the word's effect on the representation of the described

	microworld situation. Interestingly, it turns out that syntactic and semantic surprisal both have a positive effect on processing time, even though the model has no syntactic component. This finding suggests that the empirically confirmed relation between reading time and syntactic surprisal does not imply that readers use syntactic knowledge.

Speaker's Name:	Bob French
First Author's Name:	Bob French
First Author's Affiliation:	LEAD-CNRS, University of Burgundy, France
Second Author's Name:	Pierre Perruchet
Second Author's Affiliation:	LEAD-CNRS, University of Burgundy, France
Title:	The Perils of Constrained Randomization
Abstract:	All experimental psychologists understand the importance of randomizing lists of items. However, the randomization is generally constrained and these constraints, such as not allowing immediately repeated items, which are designed to eliminate particular biases, frequently engender others. Further, the experimenter is often unaware of the biases introduced by constrained randomization. By focusing on the largely unsuspected difficulties in fact, the impossibility of correctly randomizing a sequence of items in a classic paper on infant word segmentation, we hope to alert researchers, especially those who regularly use sequential lists of items where identical item repetitions are disallowed, to the pitfalls of constrained randomization.

G

Speaker's Name:	Noah Goodman
First Author's Name:	Noah Goodman
Title:	Non-modularity of the Bayesian mind
Abstract:	I will speculate about the lessons for cognitive architecture of Bayesian approaches to cognitive modeling. In particular, I will consider questions of modularity in higher-level cognition. The Bayesian viewpoint suggests modular knowledge, which is used via non- modular inference. I will illustrate this idea by investigating the interaction of causal and social knowledge. In several experiments, people are found to draw inferences about causal structure by relying on social context. These interactions can be explained by Bayesian inference over composed "modular" knowledge of causality and intentional agents.

H

Speaker's Name:	Andrew Heathcote
First Author's Name:	Lee Averell
First Author's Affiliation:	School of Psychology, University of Newcastle, Australia
Second Author's Name:	Andrew Heathcote
Second Author's Affiliation:	School of Psychology, University of Newcastle, Australia
Title:	Bayesian Analysis of Retention Functions
Abstract:	The deceptively simple question of the quantitative form of forgetting has been studied for over 100 year without adequate resolution. One view is that such lawful relations are simply not applicable to Cognitive Psychology [1].

Another view is that consensus has been clouded by data analysis problems, particularly averaging data over participants, low power and accounting for differing degrees of flexibility amongst candidate functions. In an attempt to address these problems we apply hierarchical Bayesian methods [2] to two classic data sets [3,4] and two new data sets with large numbers of observations per retention interval for each participant. Posterior sample based model selection [5] provides consistent results across these diverse paradigms (paired-associate recall, free recall and explicit and implicit stem cued recall tasks) suggesting that a consensus is possible on the quantitative form of forgetting. [1] Rodiger, H.L. (2008). Relativity of Remembering: Why the laws of memory vanished. Annual Review of Psychology, 59, 225-254. [2] Shiffrin, R.M., Lee, M.D., Kim, W., & Wagenmakers, E.-J. (2008). A survey of model evaluation approaches with a tutorial on hierarchical Bayesian methods. Cognitive Science, 32, 1248-1284. [3] Rubin, D.C., Hinton, S., & Wenzel, A.E. (1999). The precise time course of forgetting Journal of Experimental Psychology, 25, 1161-1176. [4] Wixted, J.T. & Ebbesen, E.B. (1991). On the form of forgetting. Psychological Science, 2, 409-415. [5] Raftery, A.E., Newton, M.A., Satagopam, J.M. & Krivitsky, P.N (2007). Estimating the integrated likelihood via posterior simulation using the harmonic mean identity. Bayesian Statistics, 8, 1-45.

Speaker's Name: Pernille Hemmer
First Author's Name: Pernille Hemmer
Second Author's Name: Mark Steyvers
Title: Integrating Episodic and Semantic Information in Memory for Natural Scenes
Abstract: Recall of objects in natural scenes can be influenced not only by episodic but also by semantic memory. To model the statistical regularities that might be encoded in semantic memory, we applied a topic model to a large database of labeled images. We then incorporated the learned topics in a dual-route topic model for recall that explains how and why episodic memories are combined with semantic memories. The dual-route model was applied to an empirical study in which people recall objects from scenes under varying amounts of study time. The dual route model explains how the trade-off between episodic and semantic memory is affected by study time, output position, and also congruity of the object with the scene context.

Speaker's Name: Jared M. Hotaling
First Author's Name: Jared M. Hotaling
First Author's Affiliation: Indiana University
Title: Information Integration in Perceptual Decision Making
Abstract: In cognitive science there is a seeming paradox: On the one hand researchers studying judgment and decision making have repeatedly shown that people employ simple and often less than optimal strategies when integrating information from multiple sources. On the other hand another set of researchers has had great success using Bayesian optimal models to explain information integration in fields such as categorization, perception, and memory. A perceptual

decision making experiment was designed to address this paradox via two classic findings: the conjunction fallacy and the dilution effect. The best known example of the former is the "Linda Problem", in which participants judge the probability that "Linda is a feminist and a bank teller" (P(A & B)) as greater than the probability that "Linda is a bank teller" (P(B)), thus violating the law of total probability. The dilution effect deals with situations in which there is strong evidence X favoring A over B, and weak evidence Y with lower, but still positive odds for A over B. Bayesian analysis prescribes that the odds given both X and Y should be the product of the two separate odds, thus increasing the resultant odds. However, a number of previous studies using verbal problems stated in terms of probabilities have found that people average the two sources of evidence: in effect the weak evidence dilutes the strong evidence. I will present data from a perceptual decision making experiment investigating the conditions giving rise to these deviations from normative models.

Speaker's Name: David Huber
First Author's Name: Xing Tian
First Author's Affiliation: New York University
Second Author's Name: David Huber
Second Author's Affiliation: University of California, San Diego
Title: Behavioral and electrophysiological studies of semantic satiation

Abstract: A series of experiments tested the claim that semantic satiation is neither a loss of meaning nor a loss of perception for the word form, but is instead a loss of association between the word form and its meaning. To control for fatigue between repeated and non-repeated, all experiments used a speeded matching task that contained a randomly ordered mix of repeating and non-repeating cue words. When the task was category matching and the cue was the category label, there was a slowing for the repeating category. When the repeating category was indicated by continually new exemplars, there was only facilitation. When the matching task was for the word form, there was only facilitation. As predicted by assuming that detection of novel semantics identifies mismatches, MEG revealed that this satiation corresponds to decreased M170 and M400 responses to a repeated cue but increased M400 responses to a matching target.

J

Speaker's Name: Matt Jones
First Author's Name: Matt Jones
First Author's Affiliation: University of Colorado
Second Author's Name: Fabian Canas
Second Author's Affiliation: University of Colorado
Title: Selective attention in reinforcement learning

Abstract: Reinforcement learning (RL) methods have shown great promise as models for learning complex, dynamic tasks. However, the effectiveness of these approaches depends strongly on the choice of representation. In realistic tasks with

high-dimensional state spaces, effective learning and generalization will only occur if the state of the environment is encoded in a way that captures the inherent structure of the task. We have been working on integrating RL models with principles of representational learning established in other areas of cognitive psychology, most notably category learning. There turns out to be an elegant synthesis of the two, because category learning is primarily about developing powerful representations, whereas RL involves operating on representations using sophisticated updating rules. This talk will focus on mechanisms for learning selective attention among stimulus dimensions. I will present simulation results showing how attention learning dramatically speeds RL in high-dimensional tasks, as well as (hopefully) behavioral data testing these models.

K

Speaker's Name: George Kachergis

First Author's Name: George Kachergis

First Author's Affiliation: Indiana University

Second Author's Name: Chen Yu

Second Author's Affiliation: Indiana University

Third Author's Name: Richard Shiffrin

Third Author's Affiliation: Indiana University

Title: Modeling Frequency and Context Effects in Statistical Word Learning

Abstract: Previous work has shown that humans often learn an impressive number of word-referent pairings solely from their co-occurrences across short sequences of individually ambiguous trials. The difficulty of learning a given stimulus pairing is a function of, among other factors, the frequency of that pairing during training and the number of times that pairing appeared with (and could thus be confused with) particular other pairings (i.e., contextual diversity). Our recent empirical work, which varied stimulus frequency and contextual diversity, found main effects of both factors, as well as interesting interactions. For example, high frequency pairings that co-occurred often with low frequency pairings increased learning of the low frequency pairs. To account for these results, several associative learning and decision-making mechanisms are compared in a number of simple computational models.

Speaker's Name: Mike Kalish

First Author's Name: Mike Kalish

First Author's Affiliation: University of Louisiana

Title: Gaussian process regression and human function learning

Abstract: Theories of function learning divide fairly neatly into two and half camps, based upon the sorts of representations invoked to explain people's learning and generalization. The two sorts are, broadly, explicit functions on the one hand and implicit functions derived from operations on local stimulus-criterion relationships on the other. The half is a mixture of these two. Interestingly, rational approaches to the problem of function estimation are divided similarly into 2+1 camps. I will present some data that challenge simple models, and try to suggest

that Gaussian processes (rational camp 2) offer a relatively cohesive framework for understanding human performance.

Speaker's Name: Konstantinos Katsikopoulos

First Author's Name: Konstantinos Katsikopoulos

First Author's Affiliation: Max Planck Institute for Human Development

Title: New Mechanisms for the Less-is-More Effect: A Signal Detection Approach

Abstract: A strong and interesting prediction of the theory of heuristics is that less information leads, under some conditions, to more accuracy. Without recognition errors, the "less-is-more" effect is predicted if and only if the validity α of the recognition cue exceeds the accuracy β of the knowledge used for comparing two recognized objects (Goldstein & Gigerenzer, 2002). With recognition errors, Pleskac (2007) argued that the condition A (the validity of the experience cue) > B (the accuracy of the knowledge used for comparing two experienced objects) is necessary and also jointly sufficient with high sensitivity. For Goldstein and Gigerenzer, and Pleskac, the mechanism for the less-is-more effect is that as more objects are recognized, knowledge is used instead of recognition or experience. I propose two new mechanisms. Surprisingly, they include the condition $A \leq B$. The less-is-more effect is predicted if additionally (1) the hit rate is medium and the false alarm rate is low, or (2) the false alarm rate is high and the hit rate is low. As more objects are experienced, in (1) guessing is used instead of experience or knowledge, and in (2) erroneous recognition is used instead of guessing or experience. In (1) accuracy first increases and then decreases, and in (2) accuracy first decreases and then increases—a new kind of less-is-more effect.

Speaker's Name: Christof Koch

First Author's Name: Christof Koch

First Author's Affiliation: Division of Biology and Division of Engineering and Applied Sciences, California Institute of Technology

Title: On the Relationship between the Integrated Information Theory of Consciousness and the Search for the Neuronal Correlates of Consciousness

Abstract: Integrated Information Theory (IIT) (Tononi 2004; Balduzzi & Tononi 2008) posits that consciousness is the irreducible property of `complex" networks of causally interacted components. IIT defines a fundamental quantity, integrated information (expressed in bits), which captures precisely to what extent a system is more than a collection of parts. To that extent, it constitutes a "complex," which by definition cannot be reduced to a set of independent modules. can also be thought of as a measure of interconnectedness of a system. IIT provides a principled way of characterizing a quale, a particular conscious experience: the set of informational relationships that are simultaneously available within a complex when its mechanism is in a given state. Over the last two decades, brain scientists have initiated an empirical program based on searching for the Neuronal Correlates of Consciousness (NCC), the minimal set of neuronal mechanisms jointly sufficient for any one conscious experience (Crick & Koch 1995; Koch 2004; Tononi & Koch

2008). IIT emphasizes global properties of the brain while the NCC stresses local properties, such as particular neuro-anatomical connections or firing states. In this talk, we emphasize that these two different approaches are complementary rather than conflicting. In particular, we discuss the relationship between activity in specific brain regions (e.g. visual cortex) and the quale as defined by IIT, and how the meaning of any one consciously perceived stimulus will be affected by the loss of specific neuronal populations. Finally, we will discuss certain extensions to the way can be computed and approximated for realistic biological networks.

Speaker's Name: Sid Kouider

First Author's Name: Sid Kouider

First Author's Affiliation: n/a

Title: Neural and behavioral measures of visual awareness in prelinguistic infants

Abstract: While the last decade has shown increased interest for the cognitive and neural mechanisms associated with visibility and consciousness, research has remained limited to adult populations. In fact, the enigma of when and how these abilities arise in human development has remained virtually unexplored. In order to address this issue, we studied this question in two steps. First, we used behavioral measures and took advantage of the fact that infants are heavily attracted to faces in comparison to other objects, while relying on psychophysical methods with brief presentations (>= 300 milliseconds) to estimate the temporal thresholds of infants at different stages of development. This first step allowed us to determine how human infants and adults differ in their temporal visibility thresholds, and importantly whether the development of visibility increases linearly or rather discontinuously towards maturity. While we found an absence of improvement between 5 and 10 months, as infants display remarkably similar (and relatively poor) sensitivity to brief face stimuli, we observed a sudden rise in visibility between 10 and 15 months of age. Infants in the oldest age group even showed an adult-like visibility threshold and were able to rely on memory-based strategy whereby they could keep track of the face side and subsequently improve their performance. These behavioral results reveal a developmental discontinuity in the perceptual abilities of preverbal infants, during the period surrounding their first birthday and nicely coincide with the documented dramatic increase in maturation of the prefrontal cortex at that age, which has been linked with both conscious access and working memory maintenance in adult populations. Secondly, having estimated the respective threshold of infants at different stages of development, we used high-density electoencephalography (EEG) to characterize the neural correlates of visibility. Our results show that visibility reflects different neural correlates in younger (5 month-olds) and older (12 month-olds) infants. These overall results are discussed in light of current neurocognitive theories of consciousness.

L

Speaker's Name: Michael Lee
First Author's Name: Michael Lee
First Author's Affiliation: UC Irvine
Title: New Topics for Diffusion Models
Abstract: Ratcliff and McKoon's (2008, Neural Computation, p. 916) claim that "It has probably not been realized in the wider scientific community that the class of diffusion models has as near to provided a solution to simple decision making as is possible in behavioral science." Worried that this heralds the end of Ratcliff papers entitled "A diffusion model account of ...", we suggest three topics for extending diffusion model research. The first topic involves providing a computational-level account of diffusion models, to complement the existing algorithmic- and implementation-level accounts. The second topic involves modeling the way people self-regulate parameters like boundary separation, rather than treating them as free parameters to be estimated. The third topic involves modeling the way people acquire the information needed to drive a diffusion process. We discuss some preliminary ideas and results for each of these avenues, and argue that each can help diffusion models provide better accounts and a deeper understanding of how people behave when they make simple decisions.

Speaker's Name: Stephan Lewandowsky
First Author's Name: Stephan Lewandowsky
First Author's Affiliation: University of Western Australia
Title: Working Memory and Categorization: Bridging Two Pillars of Cognition
Abstract: Working memory is crucial for many higher-level cognitive functions, ranging from mental arithmetic to reasoning and problem solving. Likewise, the ability to learn and categorize novel concepts forms an indispensable part of human cognition, and many models of category learning rely heavily on memory (albeit usually without specifying how this memory operates). However, virtually nothing is known about the relationship between working memory and categorization, and modeling in category learning has thus far been largely uninformed by knowledge about people's memory processes. I report a large-scale study (N = 113) that related people's working memory capacity (WMC) to their category-learning performance. WMC was measured by a battery of 4 tasks (two complex-span tasks, an updating task, and a spatial memory task), and category learning was measured using the 6 problem types introduced by Shepard, Hovland, and Jenkins (1961). Structural equation modeling revealed a strong relationship between WMC and category learning, with a single latent variable accommodating performance on all 6 problem types. This outcome challenges models that postulate separate memory systems for different categorization tasks. When ALCOVE was fit to the data of each individual, the pattern of variation among its parameter could be described with a single latent variable with positive loadings for exemplar learning rates (?w) and negative loadings for attentional learning rates (?a). An over-arching structural model that related the latent variables for learning, WMC, and ALCOVE's parameters revealed a strong correlation between WMC and learning rates, such that

higher WMC translated into faster exemplar learning but slower attentional learning.

Speaker's Name: Bradley Love
First Author's Name: Bradley Love
First Author's Affiliation: University of Texas at Austin
Second Author's Name: Marc Tomlinson
Second Author's Affiliation: University of Texas at Austin
Title: The Concrete Substrates of Seemingly Abstract Behaviors
Abstract: We live in a world consisting of concrete experiences, yet we appear to form abstractions that transcend the details of our experiences. I argue that the abstract nature of our thought is overstated and that our representations are inherently bound to the examples we experience during learning. The argument is supported by three lines of empirical investigation that purportedly demonstrate abstract understanding, but are more accurately described as a process of exemplar-based generalization: 1) animals' and humans' concept of same and different, 2) infant grammar learning, and 3) children's re-representation of information during problem solving. Results from these three lines of investigation are successfully modeled by the Building Relations through Instance Driven Gradient Error Shifting (BRIDGES) model. BRIDGES extends ALCOVE, an exemplar-based connectionist model of human category learning (Kruschke, 1992). Unlike ALCOVE which is limited to featural or spatial representations, BRIDGES can appreciate analogical relationships between stimuli and stored predicate representations of exemplars. Like ALCOVE, BRIDGES learns to shift attention over the course of learning to reduce error and, in the process, alters its notion of similarity. A shift toward relational sources of similarity allows BRIDGES to display what appears to be an understanding of abstract domains, when in fact performance is driven by similarity-based structural alignment (i.e., analogy) to stored exemplars.

M

Speaker's Name: Gail McKoon
First Author's Name: Roger Ratcliff
First Author's Affiliation: Ohio State University
Second Author's Name: Jeff Starns
Second Author's Affiliation: N/A
Third Author's Name: Gail McKoon
Third Author's Affiliation: Ohio State University
Title: Response time slowing with age: What is being optimized?
Abstract: We evaluated differences in boundary settings in a diffusion model analysis of reaction time and accuracy data from young and older adults. In the model, the width of the decision boundary represents the amount of evidence that must accumulate in favor of a response alternative before a decision is made. Wide boundaries lead to slow but accurate responding, and narrow boundaries lead to fast but inaccurate responding. There is a single value of boundary separation that produces the most correct answers in a given period of time, and we will refer to this value as the reward rate optimal boundary (RROB). Across a variety of decision

tasks, we consistently found that older subjects' boundary settings were much wider than the RROB value. Young subjects' boundary settings were closer to the RROB value, although age differences in optimality were smaller with instructions emphasizing speed than with instructions emphasizing accuracy. Young adults adjusted their boundary settings to more closely approach the RROB value when they were provided with accuracy feedback and extensive practice with a decision task. Older subjects showed no evidence of making boundary adjustments in response to feedback or task practice, and they consistently used boundary separation values that produced accuracy levels that were near asymptote. Our results suggest that young subjects attempt to balance speed and accuracy to achieve the most correct answers per unit time, whereas older subjects attempt to minimize errors even if they must respond quite slowly to do so.

Speaker's Name: Ben Murdock

First Author's Name: Ben Murdock

Title: Update on the TODAM Working Memory Model for Short-term Serial Memory

Abstract: The TODAM WM model is a simulation version of the Lewandowsky & Murdock (1989) chaining model for serial-order effects in short-term memory. It deals with recall, probe tests, item recognition and serial learning and has been applied to a variety of empirical effects. It uses the standard TODAM system architecture and a four-item Working Memory buffer where the storage and retrieval operations (convolution and correlation) are carried out. After a brief review of the model some recent results will be presented.

N

Speaker's Name: Ewald Neumann

First Author's Name: Ewald Neumann

First Author's Affiliation: University of Canterbury

Title: Why less than nothing is known about the role of working memory in visual selective attention: An antidote

Abstract: The aim of this series of experiments was to determine how working memory and visual selective attention interact in a dual-task situation. De Fockert, Rees, Frith, & Lavie (2001, Science) postulated that working memory is crucial for maintaining the prioritization of relevant over irrelevant information in visual selective attention tasks. If high memory load impairs people's ability to prioritize relevant over irrelevant information, there should be significantly greater interference under high load than low load conditions, which is what they reported. Notably, however, de Fockert and his colleagues reported this reaction time interference effect by comparing Congruent and Incongruent trials which not only poses difficulties for probing how working memory and selective attention interact, but also produces misleading implications. These problems were illuminated by comparing the results from the present Experiment 1 (where Congruent attention displays were omitted from the task), and Experiment 2 (where such Congruent attention displays were present). By introducing further methodological refinements

in these and several follow-up experiments, a more accurate characterization of the role of working memory in visual selective attention emerged. Implications for multi-tasking will also be discussed.

O

Speaker's Name: Klaus Oberauer

First Author's Name: Klaus Oberauer

First Author's Affiliation: University of Bristol

Second Author's Name: Stephan Lewandowsky

Second Author's Affiliation: University of Western Australia

Third Author's Name: Simon Farrell

Third Author's Affiliation: University of Bristol

Title: Modelling Complex Span Implementations of the Time-Based Resource-Sharing Model

Abstract: The complex span task is the paradigm most frequently used to measure working memory capacity. Barrouillet and colleagues have presented the Time-Based Resource-Sharing (TBRS) model to account for performance in complex span tasks (Barrouillet, Bernardin, & Camos, 2004). Memory traces are assumed to decay unless refreshed by an attentional bottleneck. The bottleneck time must be shared between refreshing and the distractor task. The model accounts for three key findings with the complex span task: (1) Performance in complex span is much worse than in comparable simple span tasks; (2) Performance depends on the proportion of time between items that is required for the distractor task, and (3) The length of the distractor activity has little effect on memory performance. So far, the TBRS has been presented only informally. We present the first computational implementation of the TBRS, showing that the model makes the predictions derived from it only with a very narrow set of additional assumptions. We also show a variant of TBRS in which interference replaces decay. The two versions of TBRS make different predictions for new experiments, and if time allows, we will present some tests of these predictions.

P

Speaker's Name: Alexandre Pouget

First Author's Name: Alexandre Pouget

First Author's Affiliation: University of Rochester

Title: Complex probabilistic inference in neural circuits with divisive normalization and probabilistic population codes

Abstract: A very wide range of computations performed by the nervous system involves a type of probabilistic inference known as marginalization. This operation comes up in seemingly unrelated computations such as causal reasoning, odor recognition, motor control, visual tracking, coordinate transforms, visual search, decision making, and object recognition, to name just a few. The question we address here is: how do neural circuits implement such marginalizations? We show that when the statistics of spike trains follow a distribution which we call Poisson-like a distribution which is close to what have been reported in vivo marginalization can be achieved with divisive

normalization, a type of nonlinear lateral inhibition which has been widely reported in neural circuits. This solution is exact for Gaussian distributions and provides near optimal solution for discrete classes.

S

Speaker's Name: Jerome Sackur

First Author's Name: Jerome Sackur

Title: Conscious access and categorical processing

Abstract: There is now a some agreement concerning the fact that non-conscious information is amenable to high level and complex cognitive processing. For instance, it has recently been shown that unconscious stimuli can trigger cognitive control, and that non conscious processing is modified in subtle ways by attentional factors. Thus, the question as to which functional advantages are brought about by conscious processing is still a matter of debate. I will here present a new proposal, suggesting that conscious access is related to what may be called the "Von Neumann problem", that is, the continuous accumulation of errors in an analogous computational device. Conscious awareness of a stimulus might correspond to the computational leap from analogous processing to discrete, categorical processing. The hypothesis is that in the brain as in man-made information processing devices, the digitization (categorization) of information helps maintain a fixed level of uncertainty, that allows for transmissions to distant processing sites and multiple-step computations. I will first present an experiment in which failure of this system is highlighted. Then, I will present a new prediction from this hypothesis: If unconscious processing is free from categorization, it might sometimes be more exact than conscious processing --- while certainly being less precise. I will present results from an orientation judgement task that suggest that this indeed might sometimes be the case.

Speaker's Name: Werner Scheider

First Author's Name: Jochen Steil

First Author's Affiliation: CoR-Lab, Bielefeld University

Second Author's Name: Werner Scheider

Second Author's Affiliation: Dep. Psychology, Bielefeld University

Title: Humans and Humanoids: Perspectives for Cognitive Science

Abstract: We feature current work of CoR-Lab the Bielefeld Research Institute for Cognition and Robotics, which in cooperation with the Honda Research Institute Europe investigates fundamentals of human cognition and approaches to make robots, including ASIMO, more intelligent. We give an overview on projects of the CoR-Lab Graduate School and present in some in detail projects on social learning in parent-infant interaction and point out their relevance for robotics. The seconde key point is to show that humanoid robots and cognitive technolgy, apart from being fascinating systems for themselves, provide entirely new means for investigating human and machine cognition in interaction.

Speaker's Name: Richard M. Shiffrin

First Author's Name: Dan R. Little

First Author's Affiliation: Indiana University
Second Author's Name: Richard M. Shiffrin
Second Author's Affiliation: Indiana University
Title: Human and Bayesian Function Estimation
Abstract: We study human's prior knowledge of likely causal functions for noisy data. Noisy data is presented simultaneously in the form of a graph of data points (including gaps and extrapolation regions). Participants are told each set of data are results from some different scientific experiment. The points are generated by various functions including polynomials of various degrees, with added Gaussian noise of high or low variance. Humans are asked to produce best guesses about the underlying causal generating function (by producing estimated values at queried points on the function). We ask whether humans balance fit and complexity in the manner suggested by by the leading statistical techniques, particularly Bayesian estimation. We also ask how well the human choices match the Bayesian posterior. We quantify Bayesian rational performance by analyzing the presented noisy data sets in two ways: a) through use of a hierarchical Bayesian polynomial regression model (which generates posterior predictions from polynomials of different degrees), and b) through a Gaussian-process regression analysis. The results are compared to human performance by applying similar analyses to the response functions produced by the human observers. We discuss the degrees of correspondence of human functions to Bayesian analysis, individual differences, the balance of fit and complexity favored by humans relative to Bayesian analyses, and differences between the two methods of Bayesian analysis.

Speaker's Name: Ozgur Simsek
First Author's Name: Ozgur Simsek
First Author's Affiliation: Max Planck Institute for Human Development
Title: Behavioral building blocks for autonomous agents
Abstract: The broad problem I will address in this talk is design of autonomous agents that can efficiently learn how to achieve desired behaviors in large, complex environments. I will focus on one essential design component: the ability to form new behavioral units (skills) from existing ones. For example, a robot that routinely manipulates objects would benefit from forming various grasping behaviors (using its lower-level sensory and motor primitives) and using them as behavioral units in its decision making. The primary subject of this talk is what makes a useful skill. For instance, what properties of grasping make it a useful skill? And, can we express the answer without reference to particular properties of grasping and manipulation tasks, using instead properties that are shared across different tasks and environments? I will present a concrete characterization of a useful class of skills. This characterization is based on a graphical representation of the agent's interaction with its environment and uses betweenness, a measure of centrality on graphs. In a diverse set of domains, this skill characterization translates into skills that are consistent with common sense, are similar to skills that people handcraft for these domains, and improve learning performance. Examples include setting up a fork in

Tic-Tac-Toe and moving the largest disk to a different peg in the Towers of Hanoi puzzle. This talk is based on my dissertation work at the University of Massachusetts Amherst (advisor: Prof. Andrew Barto).

Speaker's Name: Vladimir Sloutsky
First Author's Name: Vladimir Sloutsky
First Author's Affiliation: Ohio State University
Title: Learning Words from Context: Associative Mechanism of Early Word Learning

Abstract: Word learning consists of several very difficult problems. First, the young word learner has to solve a mapping problem – how to map a new word onto the world. And second, the word learner has to solve a generalization problem – given that most of the time words can be extended to multiple individuals, it is necessary to determine the class of entities the word refers to. Both problems are massively underdetermined by the input. Given this massive uncertainty, how do young children acquire meanings of new words? There are several proposals arguing that word learning is based on reasoning and problem solving. We suggest that in many situations learners can use statistical information to solve the mapping and generalization problems. It has been known for some time that statistical regularities in linguistic input are often reflected in associations between words: early in development words that co-occur in sentences and have high transitional probabilities (e.g., dog and bark) tend to be highly associated. In this case, presence of one word can prime the associated words and the semantic context, in which a novel word is introduced, may provide additional guidance as to what this word might mean by triggering semantic associations. We present results of four experiments supporting this account and presenting challenges to the problem solving accounts. Although this associative mechanism does not offer a complete solution to the mapping or generalization problems, it presents evidence that reasoning and problem solving are not necessary for word learning.

Speaker's Name: George Sperling
First Author's Name: George Sperling
First Author's Affiliation: UCI
Second Author's Name: Joetta Gobell
Second Author's Affiliation: Nissan Corp
Third Author's Name: Chia-huei Tseng
Third Author's Affiliation: U. of Hong Kong
Title: Similar stimuli but different illusions: Windsurfers and runways

Abstract: We demonstrate here a windsurfer illusion, a naturally occurring trapezoidal illusion in which the small end of sail viewed at a distance appears to be pointed away from the observer even when it is closer. This naturally occurring illusion is so compelling that observers are both unaware of their gross perceptual misinterpretation and they are unable to perceive the scene veridically. This illusion inspired as series of experiments to investigate depth perception in outline trapezoids. Whereas depth perception of stationary

trapezoids is sometimes ambiguous, once the trapezoids are depicted as rotating back-and-forth 20 deg in depth like an oscillating Ames window, there is an immediate and not easily reversable perception of one of two bistable 3D depth orientations. We investigate the joint effects of object shape, retinal orientation, head position, relative motion, and the direction of gravity on this perceived depth. Observers report the side that appears to be nearest. Left- and right- pointed trapezoids are perceived mirror-equivalently, the longer edge of the trapezoid is reported in front 74% of trials (traditional trapezoidal illusion, "windsurfer effect"). When the same display is rotated 90 deg in the picture plane to produce a runway retinal configuration, there is striking perceptual asymmetry: the long edge is perceived in front 97% when it is on the bottom but only 43% when it is on top ("runway effect"). The runway effect also occurs when the head is tilted 90 deg or when displays on the ceiling are viewed from the floor. The strikingly different 3D perceptions produced by identical 2D screen image sequences are quantitatively accounted by a model, the first quantitative model of this class of perceptual phenomena, The model assumes there are just three bias factors that contribute additively to the 3D depth perception: Implicit linear perspective, position below re the head/retina and position below re the world. The model accounts for 93% of the variance of the data.

T

Speaker's Name: Josh Tenenbaum

First Author's Name: Josh Tenenbaum

First Author's Affiliation: MIT

Second Author's Name: Ed Vul

Second Author's Affiliation: MIT

Title: Bayesian Models of Object Tracking in Human Adults and Infants

Abstract: Humans see the world in terms of objects. We organize low-level visual features into these coherent units, we track these objects through time, and we predict their future states as they move around us and as we move around and interact with them. The ability to identify, track and predict the motions of objects have typically been studied in different empirical literatures, and rarely explained by principled, unifying computational models. Often experiments have focused on cognitive resource limitations (such as a fixed number of "object files") that prevent successful object perception in complex scenes, without attempting to understand the more basic questions of how humans are able to make sense of multiple objects in complex scenes at all. Core versions of these object abilities exist even in young infants, as has been demonstrated in yet another literature -- the work of Spelke, Baillargeon, and many other other cognitive developmentalists -- where again principled computational models are almost unknown. In this talk I will sketch a unifying computational approach to explaining these abilities drawing on several ideas from classic and contemporary artificial intelligence and applied mathematics: a Bayesian framework for dynamic state estimation under uncertainty, simple physics-like priors on object dynamics based on Brownian motion, and optimal allocation of

information-processing resources based on probabilistic planning. With these simple principles, we can go surprisingly far towards a unifying account of basic object cognition. I will focus on explaining phenomena of multiple object tracking (MOT), but also briefly discuss applications to infant object perception and probabilistic prediction, and perceptual organization of dynamic dot displays in the Gestalt tradition. This talk is based on the work of Ed Vul, Mike Frank and Frank Jakel, with my occasional input.

V

Speaker's Name: Joachim Vandekerckhove

First Author's Name: Joachim Vandekerckhove
First Author's Affiliation: University of Leuven
Second Author's Name: Steven Verheyen
Second Author's Affiliation: University of Leuven
Third Author's Name: Francis Tuerlinckx
Third Author's Affiliation: University of Leuven

Title: A crossed random effects diffusion model for speeded semantic categorization decisions

Abstract: Choice reaction times (RT) are often used as a proxy measure of typicality in semantic categorization studies. However, other item properties have been linked to RTs as well. We apply a tailored process model of choice RT to a speeded semantic categorization task in order to deconfound different sources of variability in RT. Different aspects of the response process are then linked to different types of item properties. Typicality measures turn out to predict the rate of information uptake, while lexicographic measures predict the stimulus encoding time. Accessibility measures cannot predict any component of the decision process. Applying the diffusion model to the data at hand required its extension to a hierarchical Bayesian framework, so that a "crossed random effects diffusion model" could be constructed. This model retains the interesting process interpretation of the diffusion model's parameters, but it can be applied to choice reaction times even in the case where there are few or no repeated measurements of each participant-item combination.

Speaker's Name: Ed Vul

First Author's Name: Ed Vul
First Author's Affiliation: MIT

Title: One and done: Decisions based on few samples

Abstract: In many situations, human behavior approximates that of a Bayesian ideal observer, suggesting that at some level, cognition can be described as Bayesian inference. But how do people carryout generally intractable Bayesian computations given limited cognitive resources? I will present empirical evidence across a number of domains showing that people adopt a strategy of "sampling" to approximate computations given cognitive limitations. These data suggest that people use very few samples to make decisions and responses. I will go on to argue that if producing samples is time-consuming, a strategy of using few samples to make quick, locally suboptimal, decisions is the globally optimal policy.

W

Speaker's Name: Alex Wade
First Author's Name: Alex Wade
First Author's Affiliation: Smith Kettlewell Eye Research Institute
Second Author's Name: SP McKee
Second Author's Affiliation: n/a
Third Author's Name: J. Rowland
Third Author's Affiliation: n/a

Title: Population Coding in Early Vision

Abstract: Contrast is the fundamental currency of the human visual system and yet the link between neural responses driven by luminance variation and our perception of contrast is only partially-understood. One reason for this is there are multiple contrast normalization processes in the early visual system and contrast appearance and detection thresholds are profoundly influenced by both local and remote visual features. Remote modulation of visual contrast has been termed ﷺsurround suppressionﷺ and is the subject of active research. We have used a combination of frequency-tagged, source-imaged EEG and psychophysics to study the early neural correlates of surround suppression. In this presentation I will show that we are able to link perception with neural responses measured in multiple different visual areas. In particular, we find that neural responses in area hMT+ predict idiosyncrasies in the orientation tuning of surround suppression when measured using an appearance matching task. When we combine these findings into a two-stage model of early visual processing, we are able to use population responses from this model to predict a wide range of appearance matching and contrast discrimination data.

Home
Registration
Talk and Poster Submissions
Travel
Valle d'Aosta
Lodging
Meals
Climate & Clothing
Activities
ASIC Format
Sessions
Speakers and Abstracts
Contact

.....

NEW -- Send in your registration form.

.....

ASIC 2009

Eighth Annual Summer Interdisciplinary Conference

Contact Information:

Conference Organizer

Rich Shiffrin
Indiana University - Bloomington

Tel:
Fax:

Address Correspondence to:

Annual Summer Interdisciplinary Conference (ASIC 2009)
c/o Prof. Richard Shiffrin
Psychology Department
Indiana University
1101 E. 10th St.
Bloomington, IN 47405

Webmaster/Conference Coordinator

Please direct questions concerning the website to the webmaster:

Ruth Eberle
Indiana University - Bloomington

Muhammad Nubli Mohd Kasa
Indiana University - Bloomington
mmohdkas(at)indiana.edu