

ASIC 2017

Sixteenth Annual Summer Interdisciplinary Conference

[Home](#)
[Registration](#)
[Potential Attendees](#)
[Talk Submissions](#)
[Travel](#)
[Lodging](#)
[Meals](#)
[Activities](#)
[ASIC Format](#)
[Sessions](#)
[Speakers and Abstracts](#)
[Contact](#)



*City Hotel Oberland
Interlaken, Switzerland*

July 15, Saturday – July 20, Thursday

Announcing ASIC 2017

The Sixteenth Annual Summer Interdisciplinary Conference (ASIC 2017) will be held at City Hotel Oberland in Interlaken Switzerland, July 15 – July 20, 2017. There will be presentation sessions in the evening on each of these six days, so attendees should plan to leave no earlier than July 21. The dates are chosen to allow attendance at the Mathematical Psychology annual meeting currently planned for Warwick UK for July 22-25, and the Cognitive Science Society annual meeting currently planned for London, UK, July 26-29.

If you have a 5% or higher chance of attending, go to the link on this website 'Potential Attendees' and list yourself and your probability.

City Hotel Oberland is in the center of Interlaken, and has three adjacent buildings with two bars and three restaurants (see <http://www.city-oberland.ch/en/>--also see 'Lodging' on this site). The meetings and catered breaks will be held in one of the three hotel buildings.



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All dinners will be held at the hotel but we will have a banquet on the final night, including beer, wine, and some special offerings. The extra costs for the banquet are included in the registration fee.

Interlaken is a resort town at an altitude of about 1800 ft., and surrounded by mountains rising to about 13,000 ft. The city lies between the scenic lakes of Thun and Brienz, two lakes connected by the river Aare running through the town. It is known as the adventure sports capital of Switzerland and offers every sort of adventure sport imaginable (see the 'Activities' webpage). Interlaken is a short distance by train, car or bus from a deep valley with two branches: One leads to Grindelwald, a famous mountain resort at the base of the Eiger and Jungfrau and the other leading to a dramatic adjacent valley containing the towns of Wengen, Lauterbrunnen, and Murren. These mountains near Interlaken are at such an altitude that their peaks are usually covered with snow and ice. There is a famous train ride that starts at Interlaken and allows a round trip via one valley and a return via the other, both reaching Kleine Scheidegg where the cog-train climbs steeply via tunnels through the Eiger and eventually reaches the Jungfrauoch at 11,400 ft. – see the photo above.



The north face of the Eiger, a famous mountain just south of Interlaken.

Travel to Interlaken is made easy by the Swiss rail system, by bus, by well maintained roads, and by several nearby international airports: Bern Belp (~1 hr), Zurich Kloten (~ 2 hrs), and Basel Mulhouse (~ 2 hrs).

Richard M. Shiffrin of Indiana University - Bloomington is the organizer: Email correspondence should be directed to University (for all contact info, select 'Contact' from this website menu).



ASIC Organizer, Rich Shiffrin, atop Torre Grande, near Cortina

The subject matter of the ASIC conferences is interdisciplinary, with a primary focus lying in 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 are in the later afternoon/early evening, followed by dinner. The dates have been chosen to make it convenient for attendees to bring family/friends.



Previous Years' Websites

Several parts of this year's website are still under construction. For examples of previous years' websites visit [ASIC 2016](#), [ASIC 2015](#), [ASIC 2014](#), [ASIC 2013](#), [ASIC 2012](#), [ASIC 2011](#), [ASIC 2010](#), [ASIC 2009](#), [ASIC 2008](#), [ASIC 2007](#), [ASIC 2006](#) and [ASIC 2005](#).

Invitation

The conference is open to all interested parties, and their family and friends. 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 choose the lengths of talks. It will be of particular interest to scholars who fit the very general theme of the conference. We encourage you to send the conference information to friends and colleagues.



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, intentionally organized to maximize the dissimilarity of each day's presentations. If the number of participants exceeds the number of speaking slots (about 42 if each last 30 minutes), then the organizer will adjust talk duration, the presence of any break, and if necessary choose a subset of attendees to present their work. Information on submitting proposals for presentation is on the page of this website labeled "Talk Submissions". Please submit talk 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 with drinks and food from about 15:30-16:15 on July 15. On subsequent days there will be drinks and light snacks from 15:40 -16:00. Each of the six days will then have a presentation session of seven (or more) spoken presentations. Each session will be followed by a buffet dinner at the hotel. On the last evening this will be a banquet dinner.

The last evening of talks and dinner will be July 20, so plan to depart no earlier than July 21.

It will not escape the careful reader that this conference format frees most of the day for either discussions with colleagues or various other activities with colleagues, family, and friends. We hope and 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 16:00 should be arranged for days preceding or following the conference.

Registration

You are not officially on the request list for presenting research until you register and send the registration fee. Registration will be open on September 1, 2016. At that time or after, visit the [Registration page](#) on this website.

Lodging

A block of rooms are presently being held, but are limited (at the price negotiated), and unreserved rooms will gradually be returned to the general public, so reserve soon. For information visit the [Lodging page](#) at this website.

ASIC 2017

Sixteenth Annual Summer Interdisciplinary Conference

[Home](#)
[Registration](#)
[Potential Attendees](#)
[Talk Submissions](#)
[Travel](#)
[Lodging](#)
[Meals](#)
[Activities](#)
[ASIC Format](#)
[Sessions](#)
[Speakers and Abstracts](#)
[Contact](#)




Giessbach Falls

Registration Information for ASIC 2017

If you have a 5% or greater chance of attending ASIC 2017, please list yourself on the website at the link 'Potential Attendees'. If you reach the point where you are reasonably sure of attending, please fill out the [registration form](#) and submit your registration fee. This fee pays for rental of the conference room, conference equipment rentals, catering costs for snacks and drinks at conference breaks and receptions, several other miscellaneous costs, and the final banquet.

Registration fee schedule, in US dollars:

	To Indiana Conference Bureau
Prior to January 1, 2017	\$300
January 1, 2017 - March 1, 2017	\$360

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registration
 and
abstract submission
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After March 1, 2017

\$420

In addition to the registration fee per person, you may purchase additional guest vouchers for other persons attending the receptions, breaks, and dinners. The fee for guest attendance at breaks only is \$15 per day, paid to the Indiana Conference Bureau. The fee for each person not at the hotel who wishes to join the buffet dinner there is 30 CHF (60 CHF for the final night banquet), paid directly to the hotel.

Registration and payments are made via the Indiana University Conference Bureau as indicated on the registration form.

If a registration payment is made, but the attendee cancels prior to June 1 the registration fee will be refunded minus a \$25 handling fee. After June 1 and prior to the conference, a refund will still be made, but the handling fee will rise to \$75.

For attendees not present on July 20, please contact the organizer for a reduction of the registration fee.



ASIC 2017

Sixteenth Annual Summer Interdisciplinary Conference

[Home](#)
[Registration](#)
[Potential Attendees](#)
[Talk Submissions](#)
[Travel](#)
[Lodging](#)
[Meals](#)
[Activities](#)
[ASIC Format](#)
[Sessions](#)
[Speakers and Abstracts](#)
[Contact](#)



Submissions of Talks and Posters

Whether or not you have already sent some of this information to the organizer by email, please provide on the 'submission form' 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 plan the conference and organize the sessions. Please go to the [submission form](#). If attendance allows regular length talks, these will be limited to 30 minutes, a time that includes interruptions for questions, and final discussion. It would be best to plan for 20-24 minutes of actual speaking. The talks should be aimed not at specialists, but at a general scientific audience. Note: In order to add this information to the webpage you should use the same code that you will use to make lodging reservations. This code can be obtained by emailing the organizer at



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registration
 and
abstract submission
form.

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There is room on the program for about 42 30-minute talks. If there are more than 42 attendees wanting to present research, then the organizer will either choose some talks to be of shorter duration, or in extremity, decide which attendees will give presentations. Thus when registering and filling out the submission form, please indicate if you might be willing to 1) give a shorter talk; 2) forego giving a talk.

ASIC 2017

Sixteenth Annual Summer Interdisciplinary Conference

Travel To City Oberland Hotel Interlaken, Switzerland
Travel to and around Interlaken and Grindelwald



Note: It is a good idea to explore the area of Interlaken and nearby with Google Maps, and Google Earth.

HOW TO REACH INTERLAKEN AND CITY HOTEL OBERLAND

- Home
- Registration
- Potential Attendees
- Talk Submissions
- Travel
- Lodging
- Meals
- Activities
- ASIC Format
- Sessions
- Speakers and Abstracts
- Contact

.....



-- Send in your **registration** and **abstract submission form.**

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BY PLANE:

The main international airports giving the best access to Interlaken are:

- 1. Airport Bern Belp--
train time: 1 hour 20 min
driving time: 45 minutes**
- 2. Airport Basel Mulhouse--
train time: 2 hours 20 min
driving time: 1 hour 55 min**
- 3. Airport Zurich Kloten--
train time: 2 hours 10 min
driving time: 1 hour 45 min**



BY TRAIN:

In addition to trains from the airports, the Swiss Rail Network is known for punctual transport from all major cities, and there exists easy access by train from almost all cities in Europe

BY CAR:

Interlaken is easily accessed by the Swiss highway system, The driving directions to the hotel are perhaps best left to google maps. I advise checking in at the hotel, obtaining a free Interlaken bus pass, and driving to and parking at the Ost train station (5 CHF/day) and returning by foot or bus to the hotel.

TRANSPORT WITHIN AND BETWEEN INTERLAKEN AND GRINDELWALD:

There is extensive public transportation within Interlaken; a free bus pass for transport within the city is available upon check in.

Grindelwald is 30 minutes distant by car, and 50 minutes distant by train. One of the highlights of any visit to Interlaken or Grindelwald is a train that brings visitors high on the Jungfrau (to 3454 meters elevation). This train can be accessed from Interlaken or Grindelwald.

ASIC 2017

Sixteenth Annual Summer Interdisciplinary Conference

- Home
- Registration
- Potential Attendees
- Talk Submissions
- Travel
- Lodging
- Meals
- Activities
- ASIC Format
- Sessions
- Speakers and Abstracts
- Contact

Lodging



We have placed a hold on rooms sufficient for our conference needs at City Hotel Oberland, Interlaken, Switzerland. This is an excellent hotel with good restaurants. The hotel website is at: <http://www.city-oberland.ch/en/>.



.....
-- Send in your
registration
and
abstract submission
form.
.....

LODGING RATES

Lodging rates include breakfast and dinner (see 'Meals and Breaks' on this website). Lodging reservations should be made early starting in the fall of 2016.

Rates including breakfast and dinner per attendee per day are:

One person in a single or double room: 175 CHF/day.

Two persons in double room: 285 CHF/day

There are other rates for suites that depend on the ages of children of various ages. The hotel will provide such rates on request.



Deposit and Cancellation:

Reservations will be made and held with a credit card and a code available from the organizer.

No charges for deposit will be taken until Feb 1, 2017, and cancellations will be free of charge if made prior to Feb. 1.

Reservations made after Feb 1 and prior to April 30 require a 20% deposit. Prior reservations will be assessed this deposit on Feb 1. Cancellations after Feb 1 and prior to April 30 can be made free of charge except for a 20 CHF handling fee.

Reservations after April 30, or prior reservations, will require a 50% deposit. Cancellations may be made from April 30 to June 30 and the deposit refunded minus 10%. After July 1 payment in full is required and cancellation until July 6 will be allowed at a penalty of 50% of the total.

LODGING PLUS MEALS:

Breakfasts and dinners will be at the hotel, including the final banquet. Breaks with light food and drinks will be at or adjacent to the conference room, in the adjacent hotel building directly behind the main building and reception.

NOTE ON RATES: This ASIC is a response to many requests to hold an ASIC in Switzerland, and was chosen despite Switzerland prices that are higher than for other ASICs. At the time of this writing the Swiss Franc (CHF) is roughly on par with the US dollar. Let me note that the costs are not too high compared with US hotel prices (especially those in large cities). Even in the small town of Mammoth Lakes, the site of ASIC 2015, the lodging+meal rates were \$238 for one and \$298 for two. For US attendees to ASIC 2017, flights to Europe are of course more expensive than flights within the US, but the opportunity to visit the Interlaken/Grindelwald area, and the opportunity to combine such a trip with ones to the Cognitive Science Society and Mathematical Psychology Conferences in Europe, give me confidence that ASIC 2017 in Interlaken will be a great success.



Reservations:

The hotel is very busy in high season, so it is important to reserve early. When ready to reserve, send me an email indicating you are about to do so, and I will respond with a conference password (please keep this private). Then either call the hotel or send an email and use the password to make reservations.

Parking:

Parking at the hotel will be very limited (9 spots at most), so most attendees will be advised to use public parking in town. There is nearby underground parking at 12.50 CHF per day, but it is probably advisable to check in, obtain a free bus pass, then drive to the Ost Train Station and park there at a cost of 5 CHF/day, returning by foot (about 400 meter walk), or bus.

Internet:

Wireless Internet (WIFI) is free in public areas of the hotel, and in the guest rooms.

Address and Telephone:

City Hotel Oberland

Höheweg 7

3800 Interlaken

Switzerland

Phone. +41 (0)33 827 87 87 - Fax +41 (0)33 827 87 70

E-mail:

[Home](#)
[Registration](#)
[Potential Attendees](#)
[Talk Submissions](#)
[Travel](#)
[Lodging](#)
[Meals](#)
[Activities](#)
[ASIC Format](#)
[Sessions](#)
[Speakers and Abstracts](#)
[Contact](#)

.....

NEW -- Send in your **registration** and **abstract submission form.**

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ASIC 2017

Sixteenth Annual Summer Interdisciplinary Conference

Meals/Dining/Breaks



Breakfast and dinner buffets at the hotel are included in the daily lodging price. Breakfast is open from 6:30 – 10:00. Four course buffet dinners with vegetarian and vegan choices will be open at about 20:15-20:30. Attendees staying elsewhere may join the main group for dinner each of the first five nights at a charge of 30 CHF, or 60 CHF for the final night banquet, paid to the hotel.

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ASIC 2017

Sixteenth Annual Summer Interdisciplinary Conference

- Home
- Registration
- Potential Attendees
- Talk Submissions
- Travel
- Lodging
- Meals
- Activities
- ASIC Format
- Sessions
- Speakers and Abstracts
- Contact

Activities



The Interlaken/Grindelwald area offers a wide variety of spectacular outdoor activities, ranging from tourism and viewpoints to high adventure. Take a look at:

Interlaken Region Activities

On this site especially take note of the links under 'Summer Excursions: Mountains', and 'Summer Sports and Adventure'.

For Grindelwald see:

- [10 Best things to do in Grindlewald](#)
- [Grindlewald Attractions](#)



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NEW -- Send in your **registration** and **abstract submission form.**

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HIKING

The Interlaken/Grindelwald area is renowned for hiking and offers thousands of venues ranging from simple hikes with little difficulty (including walks along the shores of Brienz and Thun and river Aare) but with incredible views to non-technical but difficult and long climbs to local peaks with even more dramatic views. Some of the hikes are accessed by car, train, or cable car, giving ready access to the higher elevation hikes, so that they can be accomplished in time to return for the afternoon talks.

For the somewhat adventurous attendees we offer guided hikes/scrambles to some of the local mountain peaks, guided by attendee and ASIC speaker Professor Harald Atmanspacher from ETH Zurich; he is a licensed mountain guide and quite familiar with the area. His guiding rates will be standard and split among those who decide to use his services each day.





VIA FERRATA



Via Ferrata are paths along and between cliff faces and peaks that are protected by cables

and ladders affixed to the mountainsides. The user wears a harness and slings with carabiners, and attaches these to the cables, thereby providing complete protection in conditions that would otherwise be limited to technical rock climbers. These vary in length and difficulty but are safe enough that groups of local children often use these for excursions on holiday, often with an adult leader.



There are quite a few Via Ferrata in the area (if not quite so many as in Italy), and are highly recommended as somewhat more spectacular alternatives to hiking.





MOUNTAIN BIKING AND ROAD BIKING

There are very large numbers of venues for road biking and mountain biking in the area, all giving the same spectacular views offered by hiking and Via Ferrata.



ROCK CLIMBING

The Grindelwald area is known more for hiking and mountaineering rather than sport climbing (e.g. the Eiger, Jungfrau, etc). Although the area is famous for mountaineering, there are almost an uncountable number of excellent rock climbing venues that are close enough to Interlaken to be used for day climbing. These venues offer both single and multipitch routes at all levels of difficulty, and a variety of rock types. See: <https://www.timeoutdoors.com/trips/Switzerland/rock-climbing-in-the-Swiss-Alps>. For a comprehensive map of the venues see: <http://climbingaway.fr/en/climbing->

areas/luegibruggli



As usual we will offer at least one and probably two group climbing days, where we invite all climbers to come regardless of experience. We choose a scenic area with a variety of single pitch climbs. The guides set up top ropes on easy climbs and introduce first timers and novices to rock climbing. The better climbers move to somewhat more challenging climbs in the same area.



There is a climbing shop on the ground floor of the Interlaken Indoor Climbing gym, just 1.5 blocks from our hotel at Kletterhalle Interlaken AG Jungfraustrasse 44.

MOUNTAINEERING

There are numerous accessible peaks in the area of Interlaken and Grindelwald, and nearby valleys. Many can be reached in day trips by a combination of hiking and/or scrambling (Professor Harald Atmenspacher will be offering several tours). However the famous and very high altitude peaks such as the Eiger and Jungfrau are long, technical, committing, require a guide and ropes, and generally would not be suitable for conference days, but

rather attempted on days prior to or after the conference.



CANYONING

Canyoning is suitable for beginners with no experience but is an exciting and enjoyable outing. One wears a wetsuit to insure warmth, then enters a stream in a narrow canyon high in the mountains. Then one descends the stream, by walking, scrambling, floating, and sliding, whenever conditions allow. When cliffs are encountered the guide lowers the client on a rope.



WHITEWATER RAFTING

This is a sport suitable for all ages, albeit some of the more serious whitewater situations might require older and more experienced rafters.

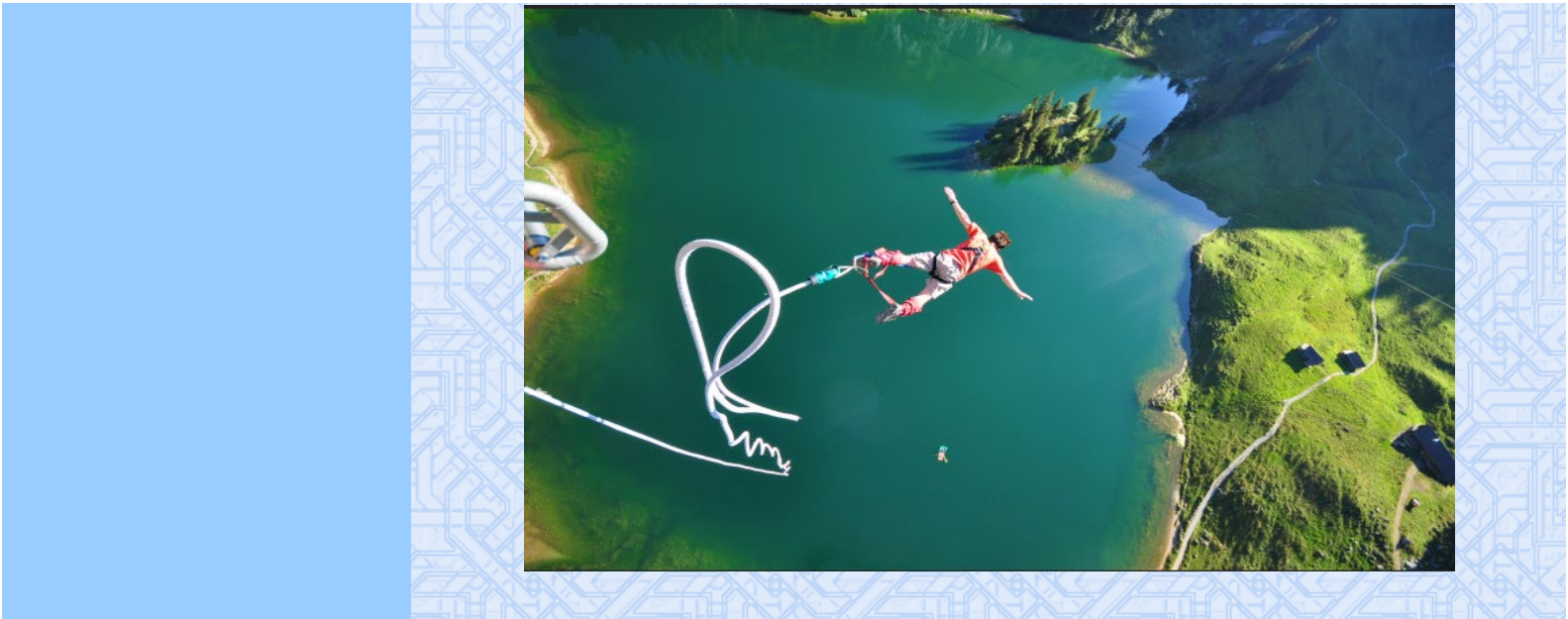


PARASAILING

For those not experienced in this sport it is best to try tandem parasailing with a guide as expert. This is a truly wonderful experience. One lifts off from a high peak or cliff in the area, and floats about with a large parasail, rising on thermal drafts (as do the birds) and offering incredible views of the local scenery as one floats about in complete calm and quiet.



Some of the other adventure sports available include Skydiving, Bungee Jumps, and Wing Suit Flying. Of course there are also a variety of regular sports, including those on or in the lakes: swimming, sailing, and boating.



ASIC 2017

Sixteenth Annual Summer Interdisciplinary Conference

[Home](#)
[Registration](#)
[Potential Attendees](#)
[Talk Submissions](#)
[Travel](#)
[Lodging](#)
[Meals](#)
[Activities](#)
[ASIC Format](#)
[Sessions](#)
[Speakers and Abstracts](#)
[Contact](#)



Format / Schedule

There will be a single speaking session each day each with seven (or more) talks. These sessions will be held in a conference room at the City Hotel Oberland. Normal talk duration will be 30 minutes including questions and discussion.

However, if there are more than 42 presenters, then some talks will be assigned shorter time limits. Information on submitting proposals for presentations is on the page of this website labeled "Talk and Poster Submissions".

The conference will start with registration and a reception at 15:30 on Saturday July 15. On subsequent days there will be drinks and light snacks starting about 15:40, followed by a speaking session starting about 16:00 or 16:15. Dinner at the hotel will follow the session at about 20:15 – 20:30.



-- Send in your
registration
 and
abstract submission
form.

.....



- [Home](#)
- [Registration](#)
- [Potential Attendees](#)
- [Talk Submissions](#)
- [Travel](#)
- [Lodging](#)
- [Meals](#)
- [Activities](#)
- [ASIC Format](#)
- [Sessions](#)
- [Speakers and Abstracts](#)
- [Contact](#)

ASIC 2017

Sixteenth Annual Summer Interdisciplinary Conference

Sessions

To be announced Later

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 -- Send in your **registration** and **abstract submission form.**

.....

ASIC 2017

Sixteenth Annual Summer Interdisciplinary Conference




[Home](#)
[Registration](#)
[Potential Attendees](#)
[Talk Submissions](#)
[Travel](#)
[Lodging](#)
[Meals](#)
[Activities](#)
[ASIC Format](#)
[Sessions](#)
[Speakers and Abstracts](#)
[Contact](#)

Authors, Titles, Abstracts

Listing by speaker

Speaker	Anderson, John
Author 1	Anderson, John Carnegie Mellon
Title	The 3-State Structure of Memory and the Environment
Abstract	Items that we encounter in our environments appear as if they are in one of three states: Lost, Background, or Current. For instance, chimpanzees in the Stevens, Marewski, Schooler, and Gilby (2016) data set had either had not been seen for years, were irregularly seen, or were regularly seen. They make appear to make discrete changes in these states. Similar patterns appear in much larger databases, for instance strings used in Twitter messages. Human memory acts as if it were making inferences about which state an item is in, and adjusting its availability accordingly, accounting for discrete changes in retrieval times.

Speaker	Atmanspacher, Harald
Author 1	Atmanspacher, Harald Collegium Helveticum, ETH and University Zurich

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registration
 and
abstract submission
form.

Title	Non-Commutative Operations in Psychology
Abstract	It will be argued that measurements whose sequence makes a difference for their results should be the rule rather than the exception in psychology. The mathematical formalism that can be applied to model such operations is based on non-commutative algebras of operations, as they are widely used in quantum theory. The basic structure of such algebras will be outlined and illustrated with one or two examples.

Speaker	Awh, Edward
Author 1	Awh, Edward University of Chicago
Author 2	Sutterer, David University of Chicago
Author 3	Foster, Joshua University of Chicago
Title	Tracking the timing and content of retrieval from long term memory with rhythmic brain activity
Abstract	Recent work has shown that the spatial distribution of alpha oscillations on the scalp tracks spatial representations in working memory and the locus of covert spatial attention. Here, we exploit the same signal to track the timing and content of retrieval from long term memory. We found that spatially-selective activity in the alpha band emerged approximately 500 ms after subjects were cued to retrieve a position that had been previously associated with a shape cue. This spatial representation was temporally coincident with the "parietal old/new" event-related potential that has previously been shown to index successful recollective events. Thus, we provide a powerful new approach for tracking both content and timing during retrieval from long term memory.

Speaker	Borner, Katy
Author 1	Borner, Katy IU
Title	Data Visualization Literacy: Definitions, Measures, Means to Advance
Abstract	This talk present the results of a recent study that examined the "data visualization literacy" of over 900 youth and adult visitors across six U.S. science museums. Results show that: a very high proportion of the population, both adult and youth, cannot interpret data visualizations beyond very basic reference systems;

construction of complex visualizations led to more accurate interpretation than deconstruction; and individuals are willing to spend time attempting to make meaning in representations depending on their personal interest in the topic. I then discuss a theoretically grounded and practically useful visualization framework that was developed to empower the broadest spectrum of users to read and make data visualizations that are useful and meaningful to them. The visualization framework was used to conduct the aforementioned study and is used to develop plug-and-play macroscopic tools that improve the (network) data visualization literacy of researchers, practitioners, IVMOOC students, museum visitors, and others.

Speaker	Burns, Devin
Author 1	Burns, Devin Missouri University of Science & Technology
Title	Dimension specific sequential effects in the Garner Paradigm
Abstract	In the Garner paradigm (and other tests of selective attention), stimuli can vary either along a “relevant” dimension which fully indicates the correct response or an “irrelevant dimension” which carries zero information about the correct response. Strong sequential effects have been shown to occur depending on which of these dimensions changes or repeats from one trial to the next, as modeled by Little, Wang, and Nosofsky (2016). This work examines these effects in a three dimensional extension of the Garner paradigm (Burns, 2016) where one dimension (orientation) is separable from an integral pair of dimensions (saturation and hue). When the irrelevant dimension is separable from the relevant dimension, its variation has no contribution to sequential effects, as expected. In this case, trials where the relevant dimension repeats should be faster than those when it changes, which occurs when orientation is being ignored in favor of either saturation or hue. However, the opposite result occurs when orientation is attended to, with trials where this dimension changes being faster than repeats! Possible causes and implications will be discussed.

Speaker	Chen, Sharon
Author 1	Chen, Sharon Syracuse University
Author 2	Criss, Amy Syracuse University
Title	The Source of List Strength Effect within REM: The Level of Competition

Abstract	To study episodic memory, we study interference. With a list strength paradigm, we study how such interference is affected by how well stimuli are encoded, and what kind of list they are in. A stimulus can be weak or strong, and it can be in a pure list, composed of all weak or all strong stimuli, or a mixed list, composed of both weak and strong stimuli. A list strength effect (LSE) refers to the interaction between stimulus strength and list type. In free recall, where the cue used at test is only context, we have consistently observed a positive LSE. Yet, in cued recall, where the cue is made of item, we have consistently observed a null LSE. Thus, we attributed the source of LSE to the type of cue used at retrieval. Based on REM, this framing is misleading. It is not the type of cue (context or item) that is critical, but the level of competition. In the citations, these two factors are confounded. Therefore, in this study, we manipulated the level of competition (between-subject) and the type of cue (within-subject) simultaneously in the list strength paradigm. Data shows LSE was determined by the level of competition, not the type of cue used to probe memory at test. Fitting REM with data confirms this statement. Nevertheless, context and item cue affected recall performance differently. Implications for models of memory will be discussed.
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Speaker	Dixon, Peter
Author 1	Dixon, Peter University of Alberta
Title	Assessing comprehension and mind wandering
Abstract	A common technique in research on mind wandering is to periodically ask subjects to self report their mental state: Were they on task or were they mind wandering? Such reports often predict performance: For example, text memory is generally worse when readers say they were mind wandering. However, this relationship doesn't imply that self reports are perfectly valid; it is still possible that any given variable only affects self report and not mind wandering (or vice versa). In order to further understand the relationship between self reports and mind wandering, I describe how text memory is related to self reports across manipulations of text interest, reading interruptions, and visual distractions. I argue that mental state reports are best understood as an indirect inference rather than as a direct, metacognitive index.

Speaker	Fourny, Ghislain
Author 1	Fourny, Ghislain ETH Zürich
Author 2	Reiche, Stéphane Mines Paris

Author 3	Dupuy, Jean-Pierre Stanford University
Title	Perfect Prediction Equilibrium: Non-Nashian dynamic games
Abstract	<p>Today, the most established paradigm of game theory is the Nash equilibrium. It predicts what people do based on the assumption that people are "rational", which makes them predictable to some extent. Many people think the Nash way. Yet, the Nash paradigm doesn't account for all our actions, in particular, it cannot explain why we keep our promises with no further incentive. Is it irrational to be honest? There is a mind-blowing problem that is well known especially in the US: Newcomb's problem. It points out that people have two different mindsets when it comes to predicting people's behavior. According to the Nash paradigm, it is rational (dominant strategy) to take two boxes (\$1000). However, while most game theoreticians, physicists, etc, do take two boxes, research shows that 75% of the people take only one box, and get a higher payoff (\$1000000). Yet no general game theory framework to date accounts for this observed behavior, or for promise-keeping in non-cooperative games. This means that there is a large territory to explore out there that we could stamp as Non-Nashian Game Theory, as an analogy to Non-Euclidian Geometry. We designed the Perfect Prediction Equilibrium as an equilibrium for dynamic games that accounts for this alternate mindset. In short, with this equilibrium, people integrate in their reasoning that they have such accurate logical and predictive skills, that a prediction is counterfactually dependent on what it predicts: The world is fully transparent. The Perfect Prediction Equilibrium (PPE) then emerges as the solution to a fixpoint problem that can be expressed in first-order logics. In this talk, I will introduce the PPE, as well as put it in perspective with other (growing) Non-Nashian literature for the normal form (Douglas Hofstadter's Superrationality as well Joseph Halpern's CCBR) or extensive form (Richard Shiffrin's locally rational decision making).</p>

Speaker	French, Bob
Author 1	French, Bob LEAD-CNRS, U. of Burgundy, France
Author 2	Mareschal, Denis Birkbeck University of London, U.K.
Title	TRACX2: a connectionist autoencoder using graded chunks to model infant visual statistical learning
Abstract	Even newborn infants are able to extract structure from a stream of sensory inputs; yet how this is achieved remains largely a mystery.

We present a connectionist autoencoder model, TRACX2, a successor of TRACX (French et al. 2011) that learns to extract sequence structure by gradually constructing chunks, storing these chunks in a distributed manner across its synaptic weights and recognizing these chunks when they re-occur in the input stream. In TRACX2, compared to the original TRACX, chunks are graded rather than all-or-nothing in nature. This reflects the (rather obvious) fact that chunks in the real world are graded. There is a smooth continuum between words like "cupboard" (who thinks "cup" and "board" when they read this word?) to words like "smartphone" in which everyone still hears "smart" and "phone". As chunks are learned their component parts become more and more tightly bound together. TRACX2 successfully models the data from five experiments from the infant visual statistical learning literature, including tasks involving forward and backward transitional probabilities, low-salience embedded chunk items, part-sequences and illusory items. It also models as well, or better than, TRACX data from a variety of auditory statistical learning experiments. The model also captures performance differences across ages through the tuning of a single learning rate parameter. These results suggest that infant statistical learning is underpinned by the same domain-general learning mechanism that operates in auditory statistical learning and, potentially, in adult artificial grammar learning.

Speaker	Goldstone, Robert
Author 1	Goldstone, Robert Indiana University
Author 2	Mills, Brian University of Florida
Title	Bias and Learning in Major League Baseball Umpires' Perceptual Judgments
Abstract	Major League Baseball home plate umpires have collectively made millions of professional pitch calls, and these calls can be compared to trajectory information recorded since 2008 for each pitch using tracking technology that is accurate to within 1 MPH and 1 inch. Furthermore, pitch, umpire, and game data are publicly available and relatively easily scraped using modern analysis tools. Using this data, we are interested in characterizing how umpires' perceptual judgments are influenced by situational factors and their own experience making calls. We fit a parametric model to account for variation in judgment policies in terms of a strike zone's horizontal and vertical center, shape, and sharpness, and the umpire's guessing probability and bias.

Speaker	Gorea, Andrei
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Author 1	Gorea, Andrei CNRS and Université Paris Descartes
Author 2	Granjon, Lionel CNRS and Université Paris Descartes
Author 3	Sagi, Dov Weizmann Institute
Title	AWARENESS OF ACTION OUTCOME AND ACTION INTENTION
Abstract	<p>How much do humans know about the outcome of their own actions? Participants performed a speeded pointing task, moving their index finger to a location briefly marked by a visual target, with and without visual feedback. They then estimated (E) their landing location (L) using the same finger with no time limit. Targets (T) were randomly flashed in one of three screen regions, straight ahead and 45° to the left and to the right of the central fixation cross. Overall, L and E precisions (1/SD) are very similar and are highly correlated across participants. This similarity argues against a Bayesian account of the results inasmuch as L and E distributions are taken to represent the prior and the posterior. L and E locations are systematically but idiosyncratically shifted away from T and L locations, respectively, suggesting participant specific errors in the sensorimotor transformation from the visual localization of T to the joint-based motor command. Trial-by-trial L-E correlations reveal an E bias away from L and toward the T of 20% and 36% in the presence and absence of visual feedback, respectively. The data are well accounted for by a model rooted in the general principles of the forward internal models. It posits that participants do not know the outcome of their pointing movements and, when asked to introspect, refer to their planned rather than actual landing locations. The end product of both action (landing) and introspection (estimation) is the noisy planned action outcome to which motor execution and introspection add independent, participant specific noises.</p>

Speaker	Grünwald, Peter
Author 1	Grünwald, Peter CWI and Leiden University
Title	Safe Hypothesis Testing
Abstract	<p>Prompted by the "reproducibility crisis" in science, the 80-year old debate on how to test a hypothesis is back with a vengeance. P-value based tests are under fire, Bayesian and confidence-based approaches, while mutually incompatible, are on the rise, and information-theoretic approaches linger in the background. Here we propose a new method that, we argue, by and large combines the</p>

best of these four worlds. This safe testing method first and foremost has a gambling interpretation - evidence against a hypothesis is measured by the amount of money gained when betting under odds that would be fair if that hypothesis were true. Safe testing allows for 'optional continuation': if a test result is promising but inclusive (say, in terms of p-values, we observe $p = 0.07$) then, if indeed we work with p-values, we cannot simply decide to gather a few more data points; this invalidates our frequentist error guarantees. With safe testing though, guarantees are preserved. It has very often been claimed (most recently by Rouder, "Optional Stopping: No Problem for Bayesians") that Bayesian approaches have no issues with optional continuation. We show that, in general, this is quite simply false - it just happens to be true for the Jeffreys-Bayesian t-test that Rouder considers. This JB t-test is, in fact, a safe test, and we characterize exactly those Bayesian tests which are also safe tests. We also show how to incorporate prior knowledge into safe tests, and how they relate to MDL.

Speaker	Guest, Olivia
Author 1	Guest, Olivia University College London
Author 2	Love, Bradley University College London
Title	Deep Networks as Models of Human and Animal Categorization
Abstract	Convolutional neural networks (CNNs) trained as classifiers learn by associating visual inputs (e.g., photographs) with labels (e.g., "crow", "dog", "car"), rivalling humans in object recognition tasks. The similarity spaces created at various network layers allow us to draw parallels with the human brain's neural coding schemes. At earlier layers, networks display similarity spaces that reflect high-level categories found in the input space, e.g., lions and tigers are more similar to one another than to mopeds. At advanced layers, similarity structure tends to break down such that representations of different object categories become orthogonal. Can these networks also shed light on how non-human animals categorize? CNNs can be used to determine at what level of representation animals are coding similarities between images. Are animals learning regularities at low levels, close to the pixels, or are they extracting abstract shape features? We address these questions using data from pigeons which have been shown to excel at classifying visual stimuli. For example, pigeons trained to discriminate between medical images of normal and cancerous breast tissue generalized to novel stimuli, attaining human expert-level accuracy. However, knowledge transfer was limited, e.g., they did not generalise between magnification levels or to greyscale images — although performance improved with additional training on greyscale images. Can CNNs explain such patterns of performance? Which network layer best captures how

pigeons categorize? We consider the broader implications of the answers to these questions for how humans and non-human animals categorize.

Speaker	Halpern, Joseph
Author 1	Halpern, Joseph Cornell
Author 2	Pass, Rafael Cornell
Author 3	Seeman, Lior Uber
Title	Decision theory with resource-bounded agents
Abstract	<p>There have been two major lines of research aimed at capturing resource-bounded players in game theory. The first, initiated by Rubinstein, charges an agent for doing costly computation; the second, initiated by Neyman does not charge for computation, but limits the computation that agents can do, typically by modeling agents as finite automata. We review recent work on applying both approaches in the context of decision theory. For the first approach, we take the objects of choice in a decision problem to be Turing machines, and charge players for the "complexity" of the Turing machine chosen (e.g., its running time). This approach can be used to explain well-known phenomena like first-impression-matters biases (i.e., people tend to put more weight on evidence they hear early on) and belief polarization (two people with different prior beliefs, hearing the same evidence, can end up with diametrically opposed conclusions) as the outcomes of quite rational decisions. For the second approach, we model people as finite automata, and provide a simple algorithm that, on a problem that captures a number of settings of interest, provably performs optimally as the number of states in the automaton increases. Perhaps more importantly, it seems to capture a number of features of human behavior, as observed in experiments.</p>

Speaker	Halpern, Joseph
Author 1	Halpern, Joseph Cornell
Author 2	Kleiman-Weiner, Max MIT
Title	Towards a Formal Definition of Blameworthiness, Intention, and Moral Responsibility

Abstract	We provide formal definitions of degree of blameworthiness and intention relative to an epistemic state (a probability over causal models and a utility function on outcomes). These, together with a definition of actual causality, provide the key ingredients for moral responsibility judgments. We show that these definitions give insight into commonsense intuitions in a variety of puzzling cases from the literature.
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Speaker	Hamilton, Larry
Author 1	Hamilton, Larry University of New Hampshire
Title	Ideological Asymmetry of Science Rejection
Abstract	Ideology-linked distrust of scientists, and rejection of scientific findings, have been observed on both left and right. Theories predict, and some experiments confirm, that similar cultural-cognition processes of identity protection, biased assimilation, motivated reasoning and elite cues can occur under diverse ideological orientations. These theories and experiments might lead us to expect a degree of left-right symmetry in science rejection -- but that expectation is rudely contradicted by current events, and also by general-public surveys. In the U.S., conservative elites and citizens have been much more likely than liberals to reject scientific findings across a range of central topics where scientists themselves overwhelmingly agree, such as evolution, climate change, vaccinations, and the age of the Earth. Moreover, surveys find disproportionate conservative distrust of scientists extending to other topics where commentators predicted the opposite pattern (nuclear power and genetically modified organisms), and also to emergent topics not previously connected to political, economic or cultural beliefs (such as the Zika virus). Many different surveys asking different questions have found common ideological gradients in distrust of science, a pattern incompatible with the usual cognitive and sociological explanations. Detailed analyses of these data suggest what hypotheses fail, and what might succeed, in explaining the ideological asymmetry of science rejection.

Speaker	Hanson, Andrew
Author 1	Hanson, Andrew Indiana University
Title	The 4D Room
Abstract	How does one design and exploit interactive environments that enable the comprehension of a higher dimensional space? How does one determine whether a higher dimensional space is "understood?" Here we focus on the transition from living in 3D space to exploring

a virtual 4D space, as even that small step seems to embody substantial effort. In earlier work, we have discussed the design and implementation of "4Dice," an iPhone App that uses the rotational behavior of a 3D die as a tutorial, and then provides a full-featured extension to the rotational behavior of a 4D die, with the intention of exposing every possible analogy to 3D space to aid in the absorption of the new properties of 4D space. Here we will describe the extension of "4Dice" to "4DRoom," a new iPhone App that moves the viewer to the center of 3D and 4D die, looking outward at the walls. One can start inside a 3D die, effectively a 3D room environment, the potential starting point for a 3D maze exploration. The second stage of the "4DRoom" application, obviously, moves the viewer to the interior of a 4D die, which embodies all the correct properties of a four-dimensional room, and provides the environment in which the analogies between the familiar 3D room and the strange 4D room can be explored in manifestly correct and rigorous geometric detail. Our 4D room application has the additional feature of supporting an optional Virtual Reality style control, with changing views accessed by rotating the hand-held device in space, as though moving one's head around in a virtual reality game, or in a New York Times VR Google Cardboard environment. We will conclude with a discussion of the issues involved in designing 2D, 3D, and 4D mazes based on sequences of room-like environments such as those supported by "4DRoom," and the question of whether one can conclude that the cognitive process of "understanding space" can be demonstrated by measuring the behavior of mice and (wo)men as they make their way through such mazes. The relevant applications, 4Dice and 4DRoom, are available free for iPhone and iPad environments on the iTunes App store: see
<https://itunes.apple.com/us/app/4dice/id453083422> and
<https://itunes.apple.com/us/app/4droom/id1239916461> .

Speaker	Howard, Marc
Author 1	Howard, Marc Boston University
Title	Toward a general model of episodic memory
Abstract	Over the past several decades, mathematical models of episodic memory tasks have clustered around two tasks. Recognition models have developed largely independently of recall models. Recall models have hypothesized that recall is moderated by a gradually-changing state of context. A subset of recall models hypothesize further that episodic memory is accompanied by recovery of a prior state of temporal context. In recent years, neurophysiological evidence has provided dramatic evidence for both of these conjectures. I will discuss the implications of these developments for a mathematical model of recognition memory based on a scale-invariant representation of temporal context.

Speaker	Khrennikov, Andrei
Author 1	Khrennikov, Andrei Linnaeus University
Title	Quantum-like model for social laser
Abstract	We discuss applications of quantum formalism to cognition and behavioural economics. Starting with consideration of conjunction and disjunction effects, we proceed to consider applications to decision making and common knowledge. Finally, macro-processes in society are compared to effects of excitation amplification as used in laser physics.

Speaker	Lewandowsky, Stephan
Author 1	Lewandowsky, Stephan University of Bristol
Title	When denial of the undeniable and logical incoherence are politically rational: An anatomy of climate change denial in an era of 'post-truth' politics"
Abstract	Although the relevant scientific community long ago settled on the conclusion that human economic activities are causing climate change through the emission of greenhouse gases, a small but vocal number of dissenters remains unswayed by the evidence. I examine the cognitive and motivational factors that underlie the rejection of scientific evidence, and I illustrate the techniques by which contrarians seek to shape public debate and mislead the public. Many of these techniques involve tacit or overt appeals to conspiracy theories, and much contrarian discourse exhibits features of conspiracist ideation. However, at a higher political level of abstraction, denial of climate change is found to be an entirely rational and politically successful activity.

Speaker	Little, Daniel R.
Author 1	Cheng, Xue Jun The University of Melbourne
Author 2	McCarthy, Callum The University of Melbourne
Author 3	Wang, Tony S. L. Brown University
Author 4	Palmeri, Thomas J. Vanderbilt University

Author 5	Little, Daniel R. The University of Melbourne
Title	Composite faces are not (necessarily) processed coactively
Abstract	Upright faces are thought to be processed more "holistically" than inverted faces. In the composite face paradigm, holistic processing is inferred from decreased recognition performance for upright and aligned composite faces compared to inverted and misaligned faces. However, the composite face task does not necessarily address the nature of holism in the way that the term is sometimes defined computationally. In a categorization task, we use the logical-rule models (Fifić, Little, & Nosofsky, 2010) and Systems Factorial Technology (Townsend & Nozawa, 1995) to examine whether composite faces are processed through pooling top and bottom face halves into a single processing channel (i.e., coactive processing) which is one mechanistic definition of holistic processing. By specifically operationalising holistic processing as the pooling of features into a single decision process in our task, we are able to distinguish it from other processing models that may underlie composite face processing. For instance, a failure of selective attention (another common definition of holistic processing) might result even when top and bottom components of composite faces are processed in serial or in parallel. Our results show that performance is best explained by a mixture of serial and parallel processing architectures across all four upright and inverted, aligned and misaligned face conditions. The results indicate multi-channel, featural processing of composite faces which is inconsistent with the notion of coactivity.

Speaker	Love, Bradley
Author 1	Love, Bradley University College London
Title	Exploration with Objective and Subjective Rewards
Abstract	In uncertain environments, effective decision makers balance exploiting options that are currently preferred against exploring alternative options that may prove superior. For example, a honeybee foraging for nectar must decide whether to continue exploiting the current patch or move to a new location. When the relative reward of options changes over time, humans explore in a normatively correct fashion, exploring more often when they are uncertain about the relative value of competing options. The prevailing view is that exploratory behaviour is uncertainty minimising, capacity-limited, and frontally mediated. However, rewards in these laboratory studies were objective (e.g., monetary payoff), whereas many real-world decision environments involve subjective evaluations of reward (e.g., satisfaction with food choice).

In such cases, rather than choices following preferences, preferences may follow choices. With subjective rewards, rather than minimise uncertainty, people may seek to maximise coherency between their preferences and behaviour. If so, increasing coherency would lessen the tendency to explore while uncertainty increases, contrary to previous findings. Indeed, a study of 280,000 individuals in supermarkets over several years found just this pattern of exploration. Consumers' patterns of exploratory choice ran counter to normative models for objective rewards – the longer the exploitation streak for a product, the less likely were people to explore an alternative. I'll present a model that captures exploratory behaviour with both objective and subjective rewards by characterising reward signals as multidimensional. The model may help explain superficially different behaviours, such as political polarisation and confirmatory biases.

Speaker	Mar, Raymond
Author 1	Mar, Raymond York University
Title	The SPaCEN Framework for Studying how Stories Relate to Social Cognition
Abstract	A great deal of research evidence points to an association between exposure to fictional narratives (e.g., books, movies, TV shows) and social cognitive processes such as mental-inference ability and empathy. However, these disparate studies have yet to be synthesized into a formal framework that makes formalizes the exact nature of how, when, and why engagement with fiction might help to promote social cognition. I will present the early workings of such a model, entitled Social Processes and Content Entrained by Narrative (SPaCEN). It argues that there are two main routes through which stories could promote social cognition, (1) through frequent engagement of social-cognitive processes or (2) the presentation of explicit content about the social world. These two possibilities are not mutually exclusive and discussion of work in this area has occasionally confused the two. I hope to outline more clearly the implications of both the process and content accounts and review the supporting evidence for each. One thing that the SPaCEN model highlights is that although a great deal of research on this topic currently exists, there remain numerous lacunae that remain unanswered and often unaddressed.

Speaker	Munro, Paul
Author 1	Munro, Paul University of Pittsburgh
Title	Emergence of a teacher signal from a self-supervised learning

	procedure
Abstract	<p>Many activity dependent learning rules have a positive and negative term that operate oppositionally. Here, a hypothetical system is described for a neuron that is partitioned into two subunits (T and L) which integrate their inputs independently. The synapses of both subunits are modified according to a learning rule that resembles the form of the Delta Rule; e.g. the Perceptron Learning Rule. Here, both subunits have a common positive term (analogous to a training signal) that is a nonlinear function of the response of one of the subunits (T), suggesting a common biological mechanism. Thus, the learning rule for T is unsupervised. The rule also incorporates a modifiable threshold and is a version of the BCM rule (an unsupervised learning rule that maximizes selectivity across a pattern space). Thus, subunit T develops a response profile that is highly selective over its stimulus environment. The positive term plays the role of a training signal for L. The result is that the L subunit develops a response profile that predicts T based on the inputs to L. This gives a biologically plausible and mathematically parsimonious account for the development of a teacher signal. Biologically, the two subunits could correspond to morphological features of a neuron; for example, in a pyramidal cell, the major dendritic trees could be the subunits. Finally a toy simulation is presented demonstrating this learning rule as a possible mechanism for the role of language in the shaping of concepts.</p>

Speaker	Neufeld, Jim
Author 1	Neufeld, Jim University of Western Ontario
Author 2	Taylor, Reggie University of Western Ontario
Author 3	Cutler, Collleen University of Western Ontario
Author 4	Theberge, Jean University of Western Ontario
Author 5	Densmore, Maria University of Western Ontario
Author 6	Williamson, Peter University of Western Ontario
Title	Analytical Cognitive Modeling is a Linchpin between Levels of Neuroimaging in Schizophrenia
Abstract	Contemporary forms of functional neuroimaging include vascular,

Blood-Oxygen-Dependent (BOLD) MRI (fMRI), Magnet Resonance Spectroscopy (fMRS), magnetoencephalography (MEG), and Evoked response Potential (ERP). Although differing in spatial and temporal resolution of neuroimaging signals, alternate forms of neuroimaging can yield complementing information about cognition-related neuro-activation and neuro-connectivity (co-activation). A point of contact for the alternate forms of neuroimaging is that of a common cognitive challenge. Ascertaining the stability of cognitive performance across different forms of neuroimaging, occasions of measurement, settings of measurement, etc., arguably demands valid analytical monitoring of the presumed MRI transcending cognition. To serve as a communalizing agent, invariance of the “f” of fMRI, etc., across the levels of functional neuroimaging should be quantitatively established. The described strategy is demonstrated in a functional cognitive neuroscience study of symptom-significant Stroop-Task performance in schizophrenia. Functional MRS (addressing functional ACC glutamatergic mechanisms) was undertaken among schizophrenia, and psychiatric, and healthy control participants, followed 1.5 hours later by an fMRI study (addressing neuro-circuitry, through BOLD-signal seed-voxel time-series covariance) all at 7.0 Tesla, and using the same Stroop paradigm throughout. Parametric and non-parametric stochastic modeling of latency distributions indicated consistency of model architecture and parameterized schizophrenia abnormalities. Convergent support for the referent process model includes strategic implementation of Euclid's lemma in addressing very short stimulus encoding times, and robustness with mixture-model extensions. It is noted that targeted events in event-related neuroimaging are expressly cognitive processes, whose intra-trial time trajectories must be delineated analytically. Signal-processing methodology commensurately increasing the temporal resolution of neuroimaging data is described.

Speaker	Oberauer, Klaus
Author 1	Oberauer, Klaus University of Zurich
Author 2	Bartsch, Lea University of Zurich
Title	Working memory for items and bindings
Abstract	What is limited by the limited capacity of working memory? One of us has argued, based on individual-differences studies, that working memory capacity reflects the ability to maintain temporary bindings between representations (Oberauer, 2005, JEP:G). This hypothesis motivated a series of experiments aimed to separately measure memory for individual items and for bindings between them. Participants remembered a variable number of word-picture pairs.

In most experiments, each word and each picture was used only once in the experiment. At test they were given one element of a pair and had to choose the other element from four options: the correct element, another element from the present trial, another element from a previous trial, and a new stimulus. With increasing number of pairs to be remembered, participants made more confusions between pairs of the current trial, but they rarely chose a stimulus from a previous trial, and hardly ever chose a new stimulus. Hence, memory load primarily decreased memory for bindings. At the same time, these experiments revealed a number of unexpected findings. First, increasing memory load beyond 4 pairs had only a negligible effect on accuracy, contrary to what would be expected from a limited-capacity working memory. Second, memory was immune to proactive interference, contrary to what would be expected if long-term memory contributed substantially to performance. Third, a distractor processing task (mental arithmetic) during the retention interval impaired memory for small but not larger set sizes. Together, these results challenge all contemporary theories of (working) memory.

Speaker	Popov, Vencislav
Author 1	Popov, Vencislav Carnegie Mellon University
Author 2	Reder, Lynne Carnegie Mellon University
Title	Repetition improves memory by strengthening existing traces: Evidence from paired-associate learning under midazolam
Abstract	The nature of the memory trace that supports recognition and recall has been a fundamental issue in memory theories. While cumulative-strength theories suggest that a single trace is strengthened after each repetition of an item, multiple-trace theories argue that repetitions create novel mnemonic traces. Here, we examined eventual cued-recall performance of paired-associates that were initially studied, tested and re-studied repeatedly without any successful recall before an injection of midazolam, a benzodiazepine that prevents the storage of novel associations. Their eventual recall performance was contrasted with other pairs that were only studied, tested and re-studied after the injection of midazolam. For both types of pairs that were included in the contrast there was a study and a failed cued-recall test after the midazolam injection. Only the pairs that had been studied prior to the midazolam injection benefitted from restudy. These results suggest that memory traces existed for the pairs that had been studied prior to the injection but that the activation or strength of those memory traces in previous tests was under the retrieval threshold. Those traces could be strengthened during the restudy phase even under midazolam. In

contrast, word pairs that had not been studied prior to the injection were not afforded an opportunity to be bound in long-term memory (LTM) because midazolam prevents the formation of new associations. These data support the cumulative-strength explanations of repetition on memory. Finally, we present a simple computational model that accounts for these effects.

Speaker	Popov, Vencislav
Author 1	Popov, Vencislav Carnegie Mellon University
Author 2	Hristova, Penka New Bulgarian University
Title	The Relational Luring Effect: Retrieval of Relational Information during Associative Recognition
Abstract	I will argue that semantic relations (e.g., works in: nurse hospital) have abstract independent representations in long-term memory and that the same representation is accessed by all exemplars of a specific relation. I will present evidence from two associative recognition experiments that uncovered a novel relational luring effect (RLE) in recognition memory. Participants studied word pairs, and then discriminated between intact (old) pairs and recombined lures. In the first experiment participants responded more slowly to lures that were relationally similar (table cloth) to studied pairs (floor carpet), in contrast to relationally dissimilar lures (pipe water). Experiment 2 extended the RLE by showing a continuous effect of relational lure strength on both RTs, false alarms and hits. It employed a continuous pair recognition task, where each recombined lure or target could be preceded by 0, 1, 2, 3 or 4 different exemplars of the same relation. RTs and false alarms increased linearly with the number of different previously seen relationally similar pairs. Moreover, more typical exemplars of a given relation lead to a stronger RLE. Finally, hits for intact pairs also rose with the number of previously studied different relational instances. These results suggest that semantic relations exist as independent representations in LTM, and that during associative recognition these representations can be a spurious source of familiarity. I will discuss the implications of the RLE for current models of semantic and episodic memory, unitization in associative recognition, analogical reasoning and retrieval, as well as constructive memory research.

Speaker	Ratcliff, Roger
Author 1	Ratcliff, Roger Ohio State University

Author 2	Mckoon, Gail Ohio State University
Title	Modeling Decision Processes on a Continuous Scale
Abstract	<p>We present a model for perceptual decision making for stimuli and responses in continuous space on lines, circles, and planes. Applications use a range of stimulus types, including perceptual, symbolic, dynamic, and static. However in this talk we will present applications to two numeracy tasks. In one, a two-digit number is presented and the participant has to move their finger to a matching location on a number line, in the other an array of dots is presented and the participant is to move their finger to a matching location on an arc. The models are diffusion processes on lines and planes. In the models, evidence from a stimulus drives the noisy decision process which accumulates evidence over time to a criterion at which point a response is initiated. Noise is represented as a continuous Gaussian process or Gaussian random field. The model produces predictions for the full distributions of response times and choice probabilities and fits to data for choice probability, RT distributions, and choice proportion and RT across the stimulus space are presented.</p>

Speaker	Ratcliff, Roger
Author 1	Ratcliff, Roger Ohio State University
Author 2	Mckoon, Gail Ohio State University
Title	Modeling Decision Processes on a Continuous Scale
Abstract	<p>We present a model for perceptual decision making for stimuli and responses in continuous space on lines, circles, and planes. Applications use a range of stimulus types, including perceptual, symbolic, dynamic, and static. However in this talk we will present applications to two numeracy tasks. In one, a two-digit number is presented and the participant has to move their finger to a matching location on a number line, in the other an array of dots is presented and the participant is to move their finger to a matching location on an arc. The models are diffusion processes on lines and planes. In the models, evidence from a stimulus drives the noisy decision process which accumulates evidence over time to a criterion at which point a response is initiated. Noise is represented as a continuous Gaussian process or Gaussian random field. The model produces predictions for the full distributions of response times and choice probabilities and fits to data for choice probability, RT distributions, and choice proportion and RT across the stimulus space are presented.</p>

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Speaker	Reder, Lynne
Author 1	Reder, Lynne Carnegie Mellon
Author 2	Popov, Vencislav Carnegie Mellon
Title	Working Memory Needs to be Re-conceptualized
Abstract	<p>Three experiments provide evidence that working memory resources are consumed as an inverse function of the familiarity of the chunks or elements being processed: In Experiment 1, Chinese characters are differentially familiarized in a visual search task. Ability to learn arbitrary pairings of these characters and recall an associated English word is easier when the constituent characters are more familiar; Furthermore, performance in an n-back is superior for blocks that use more familiar Chinese characters as stimuli, especially as the working memory load increases. Experiment 2 replicated the N-back task using pictures of “Fribbles” whose features can be more carefully controlled than Chinese characters, obviating the need to correct for encoding efficiency. The role of familiarization on consumption of working memory resources was self-evident. Experiment 3 demonstrated the effects of experimental familiarization on higher-level cognition with an algebra task that required differential use of working memory resources. In the task, participants had to solve algebraic equations with different complexity (1 vs 2 steps), and on half of the trials they had to substitute Chinese characters for associated digits. On each trial, we assigned numeric values to Chinese characters, previously familiarized in a different task, as the variables to be substituted into the equation to be solved. Performance was better when characters were highly familiar, and the effect increased as the complexity of the equation increased and when the equation required character substitution. The results strongly support the view that consumption of working memory resources depends on the familiarity of the elements to be processed.</p>

Speaker	Rieskamp, Jörg
Author 1	Rieskamp, Jörg Department of Psychology, University of Basel
Author 2	Olschewski, Sebastian Department of Psychology, University of Basel
Author 3	Scheibehenne, Benjamin Business School, University of Geneva
Title	Preference shifts or more errors: How increased cognitive load changes decision making
Abstract	How do people make preferential choices in situations where their

cognitive capacities are limited? In the literature, many studies link the manipulation of cognitive resources to qualitative changes in preferences. However, there is a widely overlooked alternative hypothesis: Namely that a reduction of cognitive capacities leads to an increase in choice error and hence less reliable preferences. We developed a mathematical model and a hierarchical Bayesian estimation to test to what extent a reduction in cognitive capacities leads to a shift in preferences or an increase in choice error. Using a within-subject n-back task to manipulate cognitive load, we conducted three experiments across different choice domains, including risky choice, temporal discounting, and strategic interaction (ultimatum game). Across all three domains results show that a reduction in cognitive capacity credibly affected participants' level of choice error rather than their respective preferences. These results hold on an individual and on a group level. In sum, our approach and the mathematical model we used provides, contrary to past work, a rigorous test of how reduced cognitive capacity affects people's decision making behavior.

Speaker	Shiffrin, Richard
Author 1	Shiffrin, Richard Indiana University
Title	Game Theory: Rational Decision Equilibrium
Abstract	In this Game Theory talk, I present an algorithm that converges on an optimal unique set of decisions by two purely selfish rational agents making sequential decisions in a large decision tree with payoffs for both agents at every leaf. Both agents have full knowledge of the decision tree and the fact that other agent does as well, and that the other agent is also selfish and a rational decision maker. The key assumption is that the two agents think similarly, and each can anticipate the reasoning of the other agent. The algorithm implements a recursive set of levels of reasoning, thus traversing each node in the decision tree multiple times, like a Chinese Rings puzzle. The premises are akin to those presented in another ASIC talk by Fourny, called 'Perfect Prediction Equilibrium', or PPE. However the two algorithms differ in critical ways, chiefly because PPE goes only one level deep in reasoning. I will make a case for my algorithm and against PPE.

Speaker	Shiffrin, Richard
Author 1	Shiffrin, Richard Indiana University
Author 2	Chandramouli, Suyog Indiana University

Title	Bayesian Assessment of Validity
Abstract	The present 'crisis of reproducibility' refers to the publication of many results that are not replicable or reproducible, and points to many reasons, such as 'file drawer effects', 'publication bias', 'inappropriate statistical criteria', 'the wrong incentive structure', and 'a variety of largely unconscious biases'. We point out that the real issue is validity, not reproducibility: Validity refers to publication of results that are real, large enough and important enough to matter, and that will generalize to similar settings. We present a Bayesian assessment of a critical component of validity, effect size, taking into account not only the observed data, but also the various sources of bias. The output is a posterior distribution of the true effect size, based on the results of one or more experiments and the biases assumed to exist in those studies. We demonstrate with the simple but real and important example of claimed demonstrations of ESP.

Speaker	Shiffrin, Richard
Author 1	Shiffrin, Richard Indiana University
Title	A Bayesian assessment of network similarity
Abstract	Consider two networks, possibly of different sizes, for which we know the numbers of nodes and links that are shared and not shared. If the nodes are not labeled this might require first aligning the two networks. I give a formula for the odds that the numbers of observed shared and not shared nodes and links are generated by random sampling from either 1) a single master network (the union of the two observed networks) or 2) two different but similar networks (they have many nodes and links in common). I propose these odds as a measure of network similarity. The calculations being not feasible for very large networks, I propose reducing the two networks in size proportionally, and using the resultant similarity as a stand-in for the large network similarity.

Speaker	Sloman, Steven
Author 1	Sloman, Steven Brown University
Title	Ignorance and the Community of Knowledge
Abstract	Asking people to explain how something works reveals an illusion of explanatory depth: Typically, people know less about how things work than they think they do. We overestimate our knowledge of common objects. We similarly overestimate our understanding of political policies. How well do you really understand Obamacare? I will argue that the reason we live in this illusion of understanding is

that we live in a community of knowledge, guided by shared intentionality. Our communities understand how things work and we fail to distinguish what we know from the knowledge that resides in other people's heads.

Speaker	Sloutsky, Vladimir
Author 1	Sloutsky, Vladimir The Ohio State University
Title	When Children Outperform Adults: An Adaptive Nature of Developmental Limitations
Abstract	Childhood is often construed as a period of developmental limitations: in almost every aspect of human functioning older children and adults outperform younger participants. However, childhood is also the time of unique opportunities in terms of learning new things. In this talk, I present new findings demonstrating how children's limitations in cognitive control, planning, and executive function result in children outperforming adults on attention and memory tasks. I then discuss an adaptive nature of these limitations and argue that they allow optimizing exploration, something that is necessary for successful learning and cognitive development.

Speaker	Sperling, George
Author 1	Sperling, George University of California, Irvine
Title	Either visual motion perception or visual attention or combination.
Abstract	Place holder while evaluating the match between possible talks and group interests

Speaker	Zacks, Jeffrey M.
Author 1	Zacks, Jeffrey M. Washington University in Saint Louis
Author 2	Wahlheim, Christopher N. University of North Carolina at Greensboro
Author 3	Eisenberg, Michelle L. Washington University in Saint Louis
Title	The role of episodic memory in event comprehension
Abstract	Memory for the recent past guides comprehension of the present and anticipation of the future. To use an event memory on-line, a

comprehender must (1) retrieve the appropriate memory at the right time, and (2) accommodate differences between what happened before and what is happening now. Doing so can, in turn (3) shape encoding for subsequent long-term memory. We propose that the mechanism that unifies these three capacities is prediction: Retrieval of previous memories enables predictions during ongoing comprehension, which in turn shapes subsequent encoding. In three experiments, we examined the consequences of noticing and remembering changes for memory for movies of everyday activities. Retrieval of event memories affected eye movements during online viewing and also affected subsequent memory for the new events. This approach gives a new insight into age-related memory impairment: Older adults were less able to use track and use differences between previous and current events to improve memory encoding.

Contact with questions.

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-- Send in your **registration** and **abstract submission form.**

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Richard and Alissa Shiffrin hanging out in Sardinia

Email preferred but if necessary address correspondence to:

**Annual Summer Interdisciplinary Conference (ASIC 2016)
c/o Prof. Richard Shiffrin
Psychological and Brain Sciences Department
Indiana University
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