The Jacob Marschak Interdisciplinary Colloquium on Mathematics in the Behavioral Sciences at UCLA

2013-2014 Schedule

September 27, 2013 | James H. Fowler, Medical Genetics and Political Science, UCSD
A Sixty-One Million Person Experiment in Social Influence and Political Mobilization

October 11, 2013 | Van Savage, Biomathematics and Ecology and Evolutionary Biology, UCLA
Cold-blooded Killers and Their Bodies: How Temperature and Size Affect Consumer-Resource Interactions

October 25, 2013 | Edward Castronova, Telecommunications and Cognitive Science, Indiana University
Gamification: A Critical Review

November 8, 2013 | Candace Thille, Education, Stanford University
Surfing the Tsunami: Technology and Pedagogical Innovation

November 22, 2013 | Robert Lempert, Frederick S. Pardee Center for Longer Range Global Policy and the Future Human Condition, RAND
Long-Term Political Sustainability of Greenhouse Gas Emissions Policies: An Agent-based, Evolutionary Approach

January 10, 2014 | Robert Kurzban, Psychology, University of Pennsylvania
Strategic Morality

January 24, 2014 | Sian Beilock, Psychology, University of Chicago
Academic Performance under Stress: At the Intersection of Emotion and Cognitive Control

February 7, 2014 | James Q. Whitman, Comparative and Foreign Law, Yale Law School
The Verdict of Battle: The Law of Victory and the Making of Modern War

February 21, 2014 | Angela Hawken, Economics and Policy Analysis, Pepperdine University
(Less) "Crime and Punishment": The Revolution in Community Corrections

March 7, 2014 | Peter Todd, Cognitive Science, Informatics and Computing, and Psychological and Brain Sciences, Indiana University, Bloomington
Seek and Find: How we Search in Space and in Mind

April 4, 2014 | Rafe Sagarin, Biosphere 2 Ocean and Institute of the Environment, University of Arizona
Learning from the Octopus: Unleashing the Biological Secrets of Adaptability

April 18, 2014 | Maroussia Favre, Department of Management, Technology, and Economics, Swiss Federal Institute of Technology Zurich
Why are there only four ways to coordinate social interactions?

May 2, 2014 | Demetri Terzopoulos, Computer Science and Computer Graphics & Vision Laboratory, UCLA
Human Simulation at the Biomechanical, Behavioral and Social Levels

May 16, 2014 | Debra Lieberman, Evolutionary Psychology, University of Miami
Ew! and Thank You: A Computational Analysis of Disgust and Gratitude

May 30, 2014 | Lisa Zunshine, English, University of Kentucky
Fiction and Social Cognition

The Jacob Marschak Interdisciplinary Colloquium on Mathematics in the Behavioral Sciences at UCLA

Young Research Library Conference Room 11360
Friday September 27, 2013
Lunch 12-1 pm — RSVP to marschak@ssc.ucla.edu | Talk 1-2:30 pm — no RSVP required

Speaker: James H. Fowler, Professor of Medical Genetics and Political Science, UCSD
Host: Martie Haselton, Professor of Psychology and Communication Studies, UCLA

A Sixty-One Million Person Experiment in Social Influence and Political Mobilization

Human behaviour is theorized to spread via face-to-face social networks, but it is difficult to identify social influence effects in observational studies and it is unknown whether online social networks operate in the same way. Here, we report results from a randomized controlled trial of political mobilization messages delivered to 61 million Facebook users during the 2010 U.S. Congressional elections. The results show that the messages directly influenced political self-expression, information seeking, and real world voting behaviour of millions of people. Furthermore, the messages not only influenced the users who received them, but the users' friends and friends of friends as well. The effect of social transmission on real world voting was larger than the direct effect of the messages themselves, and nearly all the transmission occurred between "close friends" who were more likely to have a face-to-face relationship. These results suggest that strong ties are instrumental for spreading both online and real world behaviour in human social networks.

James earned a PhD from Harvard in 2003. His work lies at the intersection of the natural and social sciences, with a focus on social networks, behavior, evolution, politics, genetics, and big data. James was recently named a Fellow of the John Simon Guggenheim Foundation, one of *Foreign Policy*'s Top 100 Global Thinkers, *TechCrunch's* Top 20 Most Innovative People in Democracy, and Most Original Thinker of the year by *The McLaughlin Group*. He has also appeared on *The Colbert Report*. His research has been featured in numerous best-of lists including *New York Times Magazine's* Year in Ideas, *Time*'s Year in Medicine, *Discover Magazine's* Year in Science, and *Harvard Business Review's* Breakthrough Business Ideas. Together with Nicholas Christakis, James wrote a book on social networks for a general audience called *Connected*. Winner of a Books for a Better Life Award, it has been translated into twenty languages, named an Editor's Choice by the *New York Times Book Review*, and featured in *Wired*, Oprah's Reading Guide, *Business Week's* Best Books of the Year, and a cover story in *New York Times Magazine*.

The Jacob Marschak Interdisciplinary Colloquium on Mathematics in the Behavioral Sciences at UCLA

Young Research Library Conference Room 11360
Friday October 11, 2013
Lunch 12-1 pm — RSVP to marschak@ssc.ucla.edu | Talk 1-2:30 pm — no RSVP required

Speaker: Van Savage, Associate Professor of Biomathematics and of
Ecology and Evolutionary Biology, UCLA, and External Faculty, Santa Fe Institute

Host: Priyanga Amarasekare, Professor of Ecology and Evolutionary Biology, UCLA

Cold-blooded Killers and Their Bodies: How Temperature and Size Affect Consumer-Resource Interactions

Understanding how mass and energy move between organisms, from resources to consumers, and how these local-scale interactions unite to drive and stabilize patterns at the population and community levels is a major goal in ecology. Biological scaling theory tries to quantify and explain how biological rates and times (e.g., metabolic rate, growth rate, and lifespan) depend on individual body size and temperature. Consequently, it holds promise for making general ecological predictions, including for how ecosystems may respond to climate change. In this talk, I discuss how biological scaling theory has largely ignored interactions between individuals and species, causing it to miss important effects that arise due to basic behavioral strategies involved in the interaction as well as physiological differences (e.g., cold-blooded consumer and warm-blooded resource) between the interacting species. I present recent work in which my group has focused on consumer-resource pairs and developed a model to predict how the component functional traits, including body velocity, detection distance, handling time, and attack rate, scale with body size and body temperature. To test these predictions, we have compiled, organized, and analyzed extensive empirical data that represent an unprecedented diversity of consumer-resource species, habitats, and foraging strategies. Predictions and empirical results can be understood by categorizing results as to whether an active-capture, sit-and-wait, or grazing foraging strategy was used and whether the consumer searches for the resource in two or three dimensions. We use these results to construct consumer-resource equations that naturally and explicitly include effects of body size and temperature on the interactions, and thus can be used to make initial predictions for equilibrium population size, probabilities of invasions, and coexistence conditions.

Van has strong interests in the effects of climate change on ecological systems, the structure and dynamics of vascular systems, and evolutionary medicine. His research program has culminated in almost 50 articles that have appeared in journals such as Science, Nature, and Proceedings of the National Academy of Sciences. These papers have received over 5,000 citations and coverage in the popular press. Van's graduate training was in theoretical particle physics at Washington University in St. Louis. He subsequently switched his research focus to problems in mathematical biology while a postdoctoral fellow at the Santa Fe Institute and Los Alamos National Laboratory. His work continued through two appointments at Harvard University before coming to UCLA. Van's work explicitly connects biological scaling theory, which captures how physiological rates and times change with body size and temperature across species, to biomedical problems as well as ecological and evolutionary dynamics. Van's goal is to obtain a more fundamental and quantitative understanding of biological systems that could help to inform and improve decisions in applied settings.

The Jacob Marschak Interdisciplinary Colloquium on Mathematics in the Behavioral Sciences at UCLA

Charles E. Young Research Library Conference Room 11360
Friday October 25, 2013
Lunch 12-1 pm — RSVP to marschak@ssc.ucla.edu | Talk 1-2:30 pm — no RSVP required

Speaker: Edward Castronova, Telecommunications and Cognitive Science, Indiana University

Host: Eddo Stern, Associate Professor of Design | Media Arts and Director, UCLA Game Lab

Gamification: A Critical Review

Universities and other organizations are in the midst of a great wave of transformation as a result of digital technologies. As a result, some previously marginalized cultural practices are coming to the fore. Nerds are now cool. So are gamers. The explosion of video game playing that began in the 1990s has now spawned a broad "gamification" movement. The thought is, with digital games being so entertaining for young people, perhaps games are the very best way to move old practices into the digital age. If a college class seems boring and behind the times, gamify it! If a corporate office seems tired and dusty, gamify it! If a political message falls on deaf ears, gamify it! The actual content of gamification varies, but typically involves some sort of networked interaction along with virtual rewards ("badges"). In this talk, I take a jaundiced view. But I also suggest that there really is something to be gained from game literacy. It is an important and growing cultural form. Gamification is hype, but games are not.

Edward Castronova is an economist whose focus is games and the game industry. Over the course of a wide-ranging career in practical social science, he has held university appointments in political science, public policy, business, and communications, and published dozens of journal articles on subjects ranging from doping in sports to the history of poverty lines. Castronova's early and never-published working paper "Virtual Worlds" (2001) is considered foundational in the rigorous scholarly study of online games, and he has published two seminal books on the topic. Castronova has appeared in the pages of the *New York Times,* the *LA Times*, the *Washington Post*, and many other media outlets. He is currently working on two books, one a guide to designing virtual economies (*Virtual Economies* with Vili Lehdonvirta, Yale) and the other a study of the looming real-world consequences of the explosion of virtual money (*Wildcat Currency*, MIT).

The Jacob Marschak Interdisciplinary Colloquium on Mathematics in the Behavioral Sciences at UCLA

Charles E. Young Research Library Conference Room 11360
Friday November 8, 2013
Lunch 12-1 pm — RSVP to marschak@ssc.ucla.edu | Talk 1-2:30 pm — no RSVP required

Speaker: Candace Thille, Assistant Professor of Education and Research Fellow in the Office of the Vice Provost for Online Learning, Stanford University

Host: Jan Reiff, Associate Professor of History, Statistics, and Digital Humanities and Chair of the Academic Senate, UCLA

Surfing the Tsunami: Technology and Pedagogical Innovation

There are two major discussions emerging out of higher education. The first is about the challenge of increasing access and completion rates, while simultaneously reducing the cost of instruction. The second is about the impact of technology on higher education, a topic brought to the fore in the past two years by the Massive Open Online Course (MOOC) phenomenon. The Open Learning Initiative (OLI) is a project that sits at the intersection of those two discussions. Using intelligent tutoring systems, virtual laboratories, simulations, and frequent opportunities for assessment and feedback, The Open Learning Initiative (OLI) is creating and evaluating a collection of web-based open learning environments that support and accelerate learning. The OLI environments also serve as a laboratory for fundamental research on learning. In this talk I will discuss how we make use of expertise from cognitive and learning sciences to produce high-quality learning environments, how the environments are collaboratively built by teams of faculty from multiple colleges, and how studies of student use inform both the next iteration of the environment and the underlying learning theory. I will present examples from OLI courses, discuss results from several learning effectiveness studies, and describe the next phase of OLI at Stanford University.

Before her recent move to Stanford, Candace Thille served as the founding director of the Open Learning Initiative at Carnegie Mellon University. Her focus is in applying the results from research in the science of learning to the design and evaluation of open web-based learning environments. Thille serves as a redesign scholar for the National Center for Academic Transformation; as a fellow of the International Society for Design and Development in Education; on the Assessment 2020 Task Force of the American Board of Internal Medicine; on the technical advisory committee for the Association of American Universities STEM initiative; and on the Global Executive Advisory board for Hewlett Packard's Catalyst Initiative. She served on a U.S. Department of Education working group, co-authoring the *National Education Technology Plan*, and on the working group of the President's Council of Advisors on Science and Technology that produced the *Engage to Excel* report. She holds a bachelor's degree from the University of California, Berkeley, a master's degree from Carnegie Mellon University, and a doctorate from the University of Pennsylvania.

The Jacob Marschak Interdisciplinary Colloquium on Mathematics in the Behavioral Sciences at UCLA

Charles E. Young Research Library Conference Room 11360
Friday November 22, 2013
Lunch 12-1 pm — RSVP to marschak@ssc.ucla.edu | Talk 1-2:30 pm — no RSVP required

Speaker: Robert Lempert, Senior Scientist at the RAND Corporation,
Director of Frederick S. Pardee Center for Longer Range Global Policy and the Future Human Condition,
and Professor of Policy Analysis at the Pardee RAND Graduate School

Host: JR DeShazo, Professor of Public Policy and Urban Planning and
Director of the Luskin Center for Innovation at UCLA

Long-Term Political Sustainability of Greenhouse Gas Emissions Policies: An Agent-based, Evolutionary Approach

Dr. Lempert's research focuses on decision-making under conditions of deep uncertainty, with an emphasis on climate change, energy, and the environment. He and his research team assist a number of natural resource agencies in their efforts to manage uncertainty in their long-range plans, including: helping the Metropolitan Water District of Southern California to identify indicators for the adaptive management component of its Integrated Resource Plan, the State of Louisiana to develop its master plan for a sustainable coast, Ho Chi Minh City to evaluate integrated flood risk management strategies, the California Department of Water Resources to develop the state water plan, and the U.S. Bureau of Reclamation to study management plans for the Colorado River. Dr. Lempert is a co-PI of SCRiM (Sustainable Climate Risk Management Strategies), an NSF-funded Sustainability Research Network. Dr. Lempert is a Fellow of the American Physical Society, a member of the Council on Foreign Relations, a member of the U.S. National Academy of Sciences Panel on Assessing the Impact of Climate Change on Political and Social Stresses, a lead author for Working Group II of the United Nation's Intergovernmental Panel on Climate Change (IPCC) Fifth Assessment Report, and a lead author for the U.S. National Climate Assessment. Dr. Lempert was the Inaugural EADS Distinguished Visitor in Energy and Environment at the American Academy in Berlin. He is an author of the book *Shaping the Next One Hundred Years: New Methods for Quantitative, Longer-Term Policy Analysis*.

A significant gap exists between the greenhouse gas reductions needed to address climate change, and what current policies seem able to deliver. It is clear that limiting climate change will require transformation of energy, transportation, and other systems. To encourage such a transformation, climate policies need to persist for decades, because greenhouse emissions result from generally slow-changing infrastructure, technology, and human behavior. But current climate policy literature – largely focused on optimal long-term paths, the implications of various long-term targets, or the efficacy of near-term policies -- provides little guidance on how near-term policy actions can shape long-term emission reduction paths. To address the long-term sustainability of climate policies, we employ new agent-based, game theoretic integrated assessment models within a robust decision making framework to compare how alternative architectures of near-term climate policies influence their long-term evolution. In particular, the model tracks the co-evolution of an industry sector, its technology base, and the shifting political coalitions that influence the future stringency of the government's emission reduction policies. The framework envisions that policy makers have a brief window of opportunity to implement a climate policy that will subsequently evolve along paths no longer under the control of those initial policy makers. We examine how policy makers might use such a window of opportunity to choose a set of initial actions that increases the chances that their long-term goals will be achieved, in part by causing transformations that will yield future conditions supportive of these goals. This general framework offers additional tools and insights to help tackle a policy challenge that heretofore has resisted much significant progress.

The Jacob Marschak Interdisciplinary Colloquium on Mathematics in the Behavioral Sciences at UCLA

Charles E. Young Research Library Conference Room 11360
Friday January 10, 2014
Lunch 12-1 pm — RSVP at marschak.ucla.edu/KurzbanRSVP | Talk 1-2:30 pm — no RSVP required

Speaker: Robert Kurzban, Associate Professor of Psychology, University of Pennsylvania
Host: Daniel M.T. Fessler, Associate Professor of Anthropology, UCLA

Strategic Morality

Some current evolutionary theories of morality hold that the adaptations that underlie moral judgment and behavior function to deliver benefits (or prevent harm) to others. I'll discuss several lines of research built around an alternative view. In particular, I'll present evidence for the view that people adopt moral positions based on calculations of their self-interest. First, in an experimental study, subjects are presented with an economic decision making game and asked to evaluate the fairness (or unfairness) of each possible decision that players in the game might make. We find that subjects are morally self-serving, reporting that decisions that leave them worse off are more "unfair." In a second body of work, people's political views change depending on non-obvious factors that shift people's perception of where their own interests lie. Finally, a third line of work speaks to the possibility that people's political attitudes are derived not from their party affiliation or their political ideology, but instead derive from calculations of their interests. These results are consistent with a view of morality that suggests that people's moral views are not adopted in order to aid others – or their group – but instead to advance their goals over various time spans.

Robert Kurzban is an Associate Professor at the University of Pennsylvania in the Department of Psychology. He received his PhD at the University of California Santa Barbara at the Center for Evolutionary Psychology, and received postdoctoral training at Caltech in the Division of Humanities and Social Sciences, UCLA Anthropology, and the University of Arizona's Economic Science Laboratory with Vernon Smith. In 2008, he won the inaugural Distinguished Scientific Award for Early Career Contribution from the Human Behavior and Evolution Society. He is currently the Editor-in-Chief of the flagship journal of Human Behavior and Evolution Society, *Evolution and Human Behavior.* He is the official blogger of the online journal, *Evolutionary Psychology*. In 2011, he published his first book, *Why Everyone (Else) is a Hypocrite: Evolution and the Modular Mind.*

The Jacob Marschak Interdisciplinary Colloquium on Mathematics in the Behavioral Sciences at UCLA

Charles E. Young Research Library Conference Room 11360
Friday January 24, 2014
Lunch 12-1 pm — RSVP at marschak.ucla.edu/BeilockRSVP | Talk 1-2:30 pm — no RSVP required

Speaker: Sian L. Beilock, Professor of Psychology and member of the Committee on Education, University of Chicago

Host: Louis M. Gomez, MacArthur Chair in Digital Media and Learning, UCLA Graduate School of Education and Information Studies

Academic Performance under Stress:
At the Intersection of Emotion and Cognitive Control

For many people, the desire to perform their best in academics is high. Consequences for poor performance, especially in examinations, include poor evaluations by mentors, teachers, and peers; lost scholarships; and relinquished educational opportunities. But, why do poor performances occur in those very situations where students are set on doing their best? What cognitive and neural processes drive less-than-optimal outcomes when the pressure is high? And, can we use knowledge about how cognitive control is altered under stress to shed light on why some people thrive while others fail in high-stakes situations? In this talk, I will discuss behavioral and brain imaging work examining how students' knowledge and general cognitive abilities interact with social and emotional factors (e.g., a student's fear of test taking) to impact performance in academic arenas such as math. Implications for education and assessment will be discussed.

Professor Beilock's research program sits at the intersection of cognitive science and education. In addition to answering basic questions about cognition, the goal of her research program is to inform educational practice and policy. Beilock is author of the bestselling book "Choke: What The Secrets Of The Brain Reveal About Getting It Right When You Have To."

The Jacob Marschak Interdisciplinary Colloquium on Mathematics in the Behavioral Sciences at UCLA

Charles E. Young Research Library Conference Room 11360
Friday February 7, 2014 @ 1-2:30 pm

Moderator: Rachel Moran, Dean and Michael J. Connell Distinguished Professor of Law, UCLA

Speaker: James Q. Whitman, Ford Foundation Professor of Comparative and Foreign Law, Yale Law School

Discussant: Michael S. McDermott, Lieutenant Colonel, United States Army and Professor of Military Science, UCLA

The Verdict of Battle

War is monstrous--a plague on mankind, an evil. Such is the modern attitude, but it was not the attitude of our ancestors. As late as the nineteenth century, they thought of going to war as a perfectly acceptable legal procedure. In particular, they thought of a pitched battle as a lawful way of settling an international dispute, a kind of trial that produced a lawful verdict through a day of slaughter.

The idea seems utterly barbaric today. Our law of war is International Humanitarian Law, dedicated to saving lives. But our ancestors' law of war was different: It was law of victory, dedicated to answering two coldblooded legal questions: *how do we know who won?* and *what rights is the victor entitled to claim?* It was devoted to subjects that seem to us savage, like the right of soldiers to strip corpses and take booty, and it was used unapologetically to reinforce the legitimacy of monarchs, even at the cost of thousands of deaths.

Barbaric indeed, from the modern point of view. Yet the old law of victory served to keep war within limits. It laid down ground rules, and encouraged commanders to keep their fighting within the limits of pitched battle. Especially in the eighteenth century, the Golden Age of limited warfare, the law of victory presided over a style of civilized monarchical warfare far more contained than our wars today.

The old law of victory died in the mid-nineteenth century, when battles like Gettysburg and Sedan failed to settle their wars. My lecture asks why the law of victory ever worked, why it stopped working, and what lessons we can still draw from it.

James Q. Whitman has taught at Yale since 1993, and at Stanford, Columbia, Harvard, NYU, and a number of European Universities. In addition to The Verdict of Battle (2012), he is the author of numerous studies in comparative law, legal history, and criminal law, among them Harsh Justice (2003), The Origins of Reasonable Doubt (2008), and "The Two Western Cultures of Privacy" (2004). He hold a Ph.D. in History from the University of Chicago and a J.D. from Yale.

The Jacob Marschak Interdisciplinary Colloquium on Mathematics in the Behavioral Sciences at UCLA

Charles E. Young Research Library Conference Room 11360
Friday February 21, 2014
Lunch 12-1 pm — RSVP at marschak.ucla.edu/HawkenRSVP | Talk 1-2:30 pm — no RSVP required

Speaker: Angela Hawken, Associate Professor of Economics and Policy Analysis and
James Q. Wilson Fellow, Pepperdine University

(Less) "Crime and Punishment": The Revolution in Community Corrections

Nearly 5 million American adults are being supervised on probation or parole. About one third of probationers and nearly one half of parolees will fail the terms of their community supervision (they are either returned to custody or abscond). Perhaps the most frustrating statistic, however, is the fact that the rates of successful completion of community supervision have remained historically stable in spite of the myriad local, State, and Federal initiatives undertaken to improve offender outcomes. The robustness of these failure rates highlights the need to develop an offender management approach that goes beyond the status quo. In this talk I will share evidence from a series of studies (including randomized controlled trials) showing that it is possible to have less crime *and* less punishment by re-engineering the community corrections process. This new approach, which I call *Behavioral Triage*, relies on basic principles of behavior change: clearly articulated rules, swift responses to detected violations, consistent and fair sanctions, and *small* doses of punishment. The result is dramatic reductions in drug use, new crimes, and incarceration.

Angela Hawken, PhD is associate professor of economics and policy analysis at the School of Public Policy at Pepperdine University. She is from South Africa, where she taught undergraduate and graduate econometrics and microeconomics before moving to Los Angeles in 1998. She teaches graduate classes in research methods, econometrics, applied methods for policy analysis, crime, and social policy. Her research interests are primarily in drugs, crime, and corruption. At RAND, she conducted research on early education, sentencing, and tort reform. She conducted the statewide cost-benefit analysis of California's Proposition 36, and led the randomized controlled trial of Hawaii's Opportunity Probation with Enforcement (HOPE), a swift-and-certain-sanctions model to manage high-risk probationers. Drug Czar, Gil Kerlikowske, identified HOPE as the most promising initiative that "not only prevents recidivism, but also actively assists individuals to transition to productive lives." There are now at least 40 mainland jurisdictions using HOPE-style models (in 18 states), and Washington State rolled out the program statewide in 2012. Hawken is co-author of *Drugs and Drug Policy: What Everyone Needs to Know* (Oxford University Press, 2011), and *Marijuana Legalization: What Everyone Needs to Know* (Oxford University Press, 2012).

The Jacob Marschak Interdisciplinary Colloquium on Mathematics in the Behavioral Sciences at UCLA

Charles E. Young Research Library Conference Room 11360
Friday March 7, 2014
Lunch 12-1 pm — RSVP at marschak.ucla.edu/ToddRSVP | Talk 1-2:30 pm — no RSVP required

Speaker: Peter M. Todd, Professor of Cognitive Science, Psychology, and Informatics, Indiana University, Bloomington

Host: Francis Steen, Associate Professor of Communication Studies, UCLA

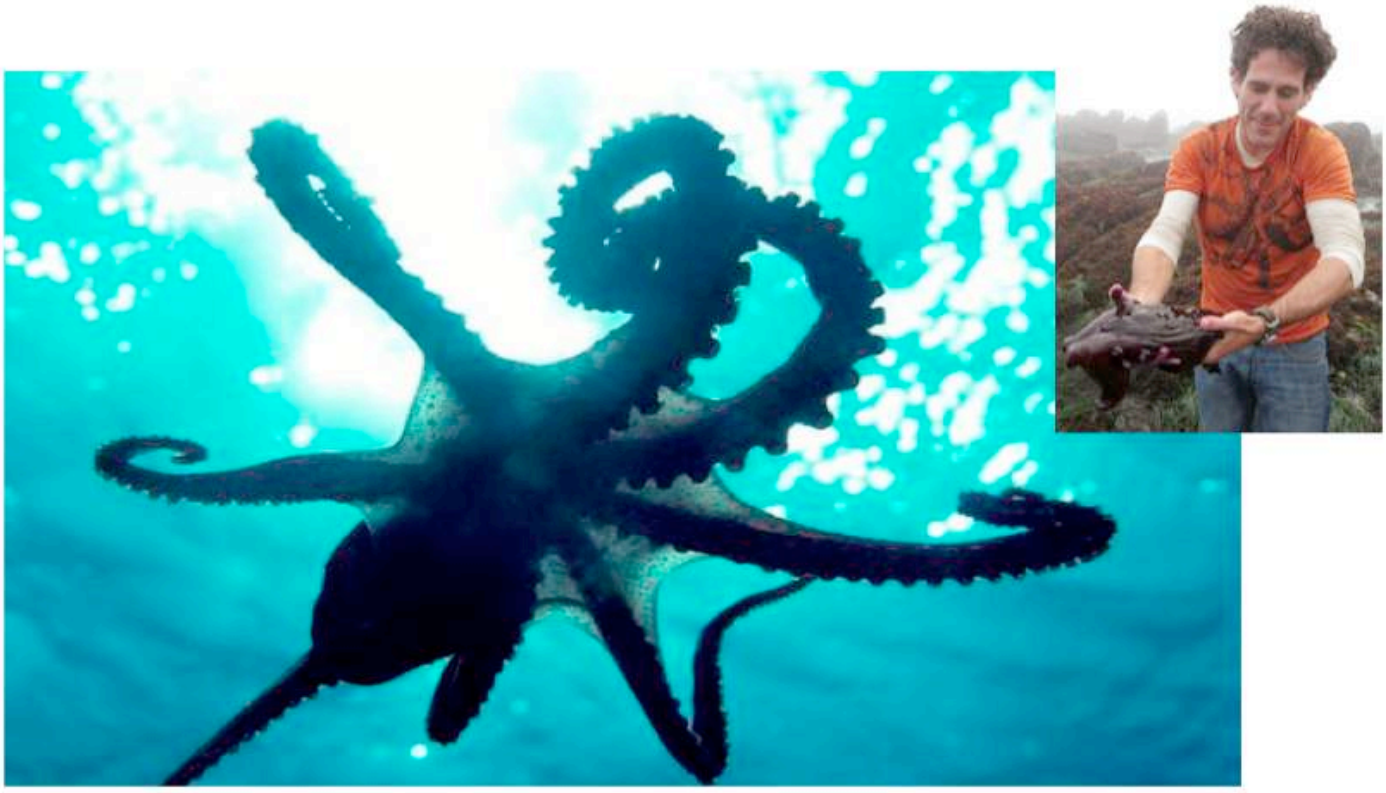
Seek and Find : How We Search in Space and in Mind

How do we decide when to search for something better and when to stick with what we've got? Organisms must adaptively trade off between exploring and exploiting their environment to obtain the resources they need. This applies to whatever space they are searching: whether the external spatial environment, looking for patches of food; the social environment, looking for mates or friends; or the internal mental environment, looking for information in memory. Common underlying mechanisms may be used to address the explore/exploit tradeoff in each. People use similar heuristic strategies to decide when to keep looking and when to give up searching for resources in patches in space (e.g., for fish in a pond) and in memory (e.g., for words in a category), as predicted by optimal foraging theory. Moreover, searching in an external domain can prime subsequent search strategies in an internal domain. In this talk, I will describe how new studies are uncovering these connections between spatial search and cognitive search.

Peter M. Todd grew up in Silicon Valley, received a PhD in psychology from Stanford University, and in 1995 moved to Germany to help found the Center for Adaptive Behavior and Cognition (ABC), based at the Max Planck Institute for Human Development in Berlin. The Center's work on decision making was captured in the books *Simple Heuristics That Make Us Smart* (OUP, 1999) and *Ecological Rationality: Intelligence in the World* (OUP, 2012). Todd moved to Indiana University in 2005 where his research focuses on the cognitive mechanisms that people use to make decisions about adaptively important resources—including mates, information, and food—in space and time. His most recent book is *Cognitive Search: Evolution, Algorithms, and the Brain* (Todd, Hills, and Robbins, eds.; MIT Press, 2012).

The Jacob Marschak Interdisciplinary Colloquium on Mathematics in the Behavioral Sciences at UCLA

Charles E. Young Research Library Conference Room 11360
Friday April 4, 2014
Lunch 12-1 pm — RSVP at marschak.ucla.edu/SagarinRSVP | Talk 1-2:30 pm — no RSVP required



Speaker: Rafe Sagarin, Program Manager for Biosphere 2 Ocean,
Associate Research Professor, Institute of the Environment, University of Arizona

Host: Daniel Blumstein, Professor and Chair, Ecology and Evolutionary Biology, UCLA

Learning from the Octopus:
Unleashing the biological secrets of adaptability

Organisms in nature have been successfully using adaptation to survive and thrive on a risk filled planet for billions of years. Dr. Sagarin will share nature's secrets for adaptation and discuss how they can be applied to the societal management of risks, ranging from terrorism to public health emergencies, to economic downturns and climate change. He will weave fascinating stories of adaptability found in viruses to ecosystems in with stories about the remarkable characters he has worked with, including a former British secret agent, a blind paleontologist, and a daring marine captain who didn't wait for the Pentagon to approve his radical plans for adapting to risk.

Dr. Sagarin is an ecologist, writer, artist, and expert on adaptation. A recipient of the Guggenheim Fellowship, he serves as a consultant to organizations including the American Red Cross, the U.S. Department of Defense, and marketing departments of the world's largest corporations. His interdisciplinary research has been published in the leading peer-reviewed journals in science, environmental studies, law, and international affairs, as well as in popular magazines and newspapers. Dr. Sagarin has lectured and held research positions at the world's top universities including Stanford, Duke, UCLA and University of Arizona. He served as an American Association for the Advancement of Science Congressional Science Fellow in the office of U.S. Representative Hilda Solis. His two recent books are *Learning from the Octopus: How Secrets from Nature Can Help Us Fight Terrorism, Natural Disasters, and Disease* (Basic Books) and *Observation and Ecology: Broadening the Scope of Science to Understand a Complex World* (Island Press).

The Jacob Marschak Interdisciplinary Colloquium on Mathematics in the Behavioral Sciences at UCLA

Charles E. Young Research Library Conference Room 11360
Friday April 18, 2014
Lunch 12-1 pm — RSVP at marschak.ucla.edu/FavreRSVP | Talk 1-2:30 pm — no RSVP required

Speaker: Maroussia Favre, Department of Management, Technology, and Economics,
Swiss Federal Institute of Technology Zurich (ETHZ)

Host: Marco Verweij, Professor of Political Science, Jacobs Universität Bremen

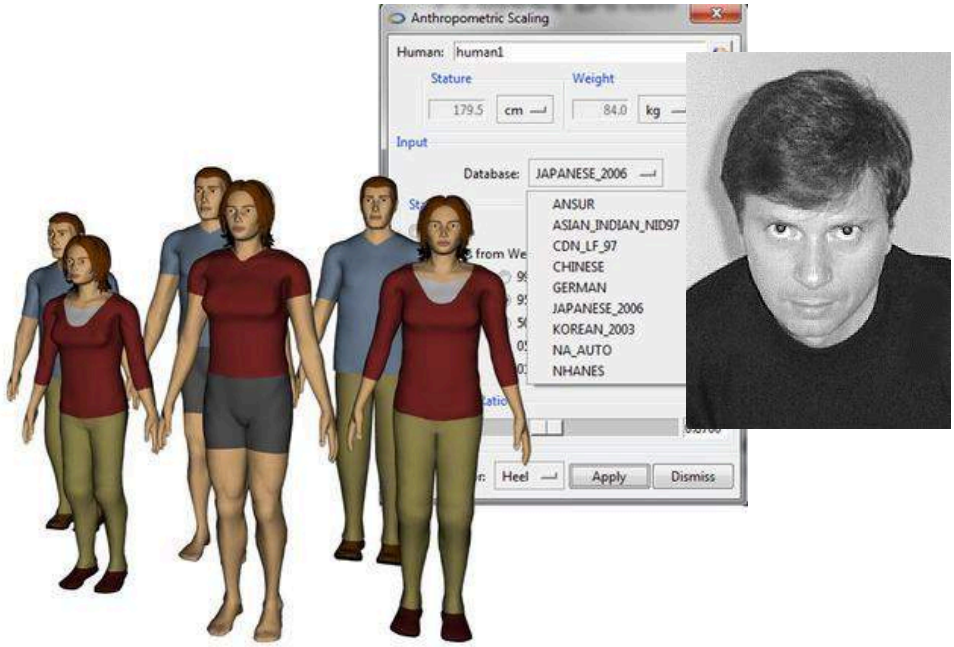
Why are there only four ways to coordinate social interactions?

Relational models theory postulates that there are only four ways to coordinate social interactions: Communal Sharing, Authority Ranking, Equality Matching, and Market Pricing. In the face of cultural diversity and social complexity, this can sound like a bold claim. However, in disciplines such as physics and biology, we know that just a few simple rules acting at the micro level can generate a rich complexity at the macro level. So why just these four relational models? Maroussia offers a mathematical proof of the exhaustiveness of the four relational models, based on a simple setting of two agents that can act in one out of three ways toward each other: give (or do) A, B, or nothing. With interdisciplinarity in mind, Maroussia shows how this representation allows us to draw links between relational models theory, game theory, biology, network theory, mathematics and complexity theory. Maroussia's talk is based on her research article, written with Didier Sornette, "Categorization of exchange fluxes explains the four relational models."

Maroussia Favre is a Ph.D. student affiliated with the department of Management, Technology and Economics (MTEC) at the Swiss Federal Institute of Technology in Zurich (ETHZ). She studied physics at the Swiss Federal Institute of Technology in Lausanne (EPFL), all the while maintaining a strong interest in the humanities. Her master's thesis was in mathematical/statistical physics about phase transitions in dynamical systems. She subsequently worked as an internal auditor in a bank before finding a research group where she could reconcile her interests in complex dynamical systems, social sciences and anthropology. Under the supervision of Didier Sornette, Professor on the Chair of Entrepreneurial Risks at the Swiss Federal Institute of Technology Zurich, she is developing analytical and agent-based models to explore from an evolutionary perspective how biological and environmental factors shaped human demographic history and social behavior, including various traits such as cooperation, competition, gender differences and risk-taking behavior.

The Jacob Marschak Interdisciplinary Colloquium on Mathematics in the Behavioral Sciences at UCLA

Charles E. Young Research Library Conference Room 11360
Friday May 2, 2014
Lunch 12-1 pm — RSVP at marschak.ucla.edu/TerzopoulosRSVP | Talk 1-2:30 pm — no RSVP required



Speaker: Demetri Terzopoulos, Chancellor's Professor of Computer Science,
Director, Computer Graphics and Vision Laboratory, UCLA

Host: Judea Pearl, Professor of Computer Science and Statistics, UCLA

Human Simulation at the Biomechanical, Behavioral, and Social Levels

The primary focal points to date regarding human simulation have been biomechanical, behavioral, and social modeling, specifically (1) the comprehensive physical simulation of the human body, confronting the challenge of modeling all the relevant articular bones and soft tissues as well as controlling the skeletal muscles to synthesize realistic actions, (2) an artificial life framework for multi-human simulation that addresses the rich complexity of human activity in urban environments, enabling 3D virtual worlds populated by lifelike autonomous pedestrians, and (3) nontrivial social considerations in the simulation of virtual pedestrians, among them the emulation of proper door and doorway etiquette. There are profound scientific and computational challenges that still remain in comprehensively modeling and simulating humans across the physical-to-social spectrum.

Demetri Terzopoulos (PhD '84 MIT) is a Guggenheim Fellow, a Fellow of the ACM, IEEE and Royal Society of Canada, and a Member of the European Academy of Sciences and Sigma Xi. Among his many awards are an Academy Award for Technical Achievement from the Academy of Motion Picture Arts and Sciences for his pioneering work on physics-based computer animation, and the inaugural Computer Vision Distinguished Researcher Award from the IEEE for his pioneering and sustained research on deformable models and their applications. One of the most highly cited authors in engineering and computer science according to ISI and other indexes, his publications include more than 300 research papers and several volumes, primarily in computer graphics, computer vision, medical imaging, computer-aided design, and artificial intelligence/life. Prior to joining UCLA in 2005, Dr. Terzopoulos held the Lucy and Henry Moses Endowed Professorship in Science at New York University and was Professor of Computer Science and Mathematics at NYU's Courant Institute of Mathematical Sciences. Previously, he was Professor of Computer Science and Professor of Electrical and Computer Engineering at the University of Toronto.

The Jacob Marschak Interdisciplinary Colloquium on Mathematics in the Behavioral Sciences at UCLA

CHANGE IN LOCATION! | 2343 Public Affairs Building (Luskin School)
Friday May 16, 2014
Lunch 12-1 pm — RSVP at marschak.ucla.edu/LiebermanRSVP | Talk 1-2:30 pm — no RSVP required

DIFFERENT ROOM THAN USUAL: 2343 Public Affairs Building (Luskin School)

Speaker: Debra Lieberman, Associate Professor of Psychology, University of Miami
Host: Gregory Bryant, Associate Professor of Communication Studies, UCLA

Ew! and Thank You:
A Computational Analysis of Disgust and Gratitude

A typical starting point in the emotion literature is that an emotion is a response with a characteristic facial expression, is of short duration, and is associated with particular qualia. Privileging these features limits the roster of potential emotions and tends to ignore evolved function. According to evolutionary psychologists, an emotion is a computational program that evolved to coordinate psychological and physiological systems in a manner that produced adaptive outcomes in ancestrally recurring situations. Using this definition, I discuss the evolved function and computational structure of disgust and gratitude, two emotions we are working on in our lab. Using these two emotions as examples, I suggest that developing an information-processing model for other emotions—or any other evolved specialization—is a useful tool and can help functionally define the system in question, identify moderators, and generate testable hypotheses.

Debra Lieberman earned her PhD at the Center for Evolutionary Psychology at the University of California, Santa Barbara. She has published in the areas of kinship, emotion, and morality. Her current research interests include human kin detection, specifically the cues males use to identify offspring; gratitude and its role in the formation of friendships; and the role emotions play in the legal sphere, for instance in cases of provocation.

DIFFERENT ROOM THAN USUAL: 2343 Public Affairs Building (Luskin School)

The Jacob Marschak Interdisciplinary Colloquium on Mathematics in the Behavioral Sciences at UCLA

Friday May 30, 2014 | Charles E. Young Research Library Conference Room 11360
Lunch 12-1 pm (RSVP at marschak.ucla.edu/ZunshineRSVP) | Talk 1-2:30 pm (no RSVP)

Speaker: Lisa Zunshine, Bush-Holbrook Professor of English, University of Kentucky
Host: Francis Steen, Associate Professor of Communication Studies, UCLA

Fiction and Social Cognition

An old tree next to my house needs to be cut down, yet the contractor keeps postponing, and I am worried that yet another dead branch will fall on my neighbors' car. I don't know how they explain to themselves that I haven't yet taken care of it. I want them to know that I am thinking about this issue. I shall email them.

I *want* them to *know* what I *think*—a mental state within a mental state within a mental state—three nested mental states. As I survey my day, more examples of such nestings from different occasions come to mind. She thought that I meant the opposite of what I actually meant. He didn't want me to know what he was really thinking. I don't want her to realize that I am trying out this new communication strategy that I just learned from a book. When he's older, do you think he'll forget how he felt when he was four?

It's difficult to say how much of our daily functioning involves nesting mental states within each other in this recursive fashion (particularly since we don't stop and think about it consciously the way I just did). It seems to me that we do it often, though not constantly. Involved social situations call for at least some triply-nested thoughts and feelings. Or, perhaps, involved social situations are *created* by our ability to entertain such nestings.

Fiction is where it gets interesting. As I show in my talk, nested mental states constitute a fundamental unit of meaning in fiction, yet writers can construct them by referring to other mental states or without mentioning mental states at all.

Why is this important? Can a computer count mental states in novels? Does it matter if preschoolers are read stories that spell out the mental states of characters? What happens when literary scholars use research from cognitive science to study fiction? And why do we read fiction, anyway?

A former Guggenheim fellow, Lisa Zunshine is the author or editor of eleven books, including, *Why We Read Fiction: Theory of Mind and the Novel* (2006), *Strange Concepts and the Stories They Make Possible: Cognition, Culture, Narrative* (2008), *Introduction to Cognitive Cultural Studies* (2010), and *Getting Inside Your Head: What Cognitive Science Can Tell Us About Popular Culture* (2012).