Jeremy Karnowski

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Research Interests

Multi-agent behavior, origins of communication, computational cognitive ethology, machine learning, data mining, robotics

Education

2010–present **Ph.D. Cognitive Science, Specialization in Anthropogeny (anticipated)**, *University of California, San Diego*, San Diego, CA.

2012 **M.S. Cognitive Science**, *University of California, San Diego*, San Diego, CA.

2006 **Non-degree study**, *U.S. Peace Corps Preservice Training*, Morogoro, Tanzania.
Swahili language study, teacher training, and cross-cultural skills training

2002-2006 **B.S. Cognitive Science**, *Indiana University*, Bloomington, IN.
General Honors, Departmental Honors, Minor in Biology

2002-2006 **B.S. Mathematics**, *Indiana University*, Bloomington, IN.
General Honors, Departmental Honors, Minor in Computer Science

Research Experience

June 2012–present **Graduate Student**, *UCSD*, San Diego, CA, CogSci Dept.; PI: Dr. Edwin Hutchins.
Investigating the emergence of the capacity for symbolic representation through the use Dec-POMDPs. Developing tools to isolate dolphin vocalizations in audio data and track dolphin position in video data to establish relationships between vocalizations, social configuration, and behavior.

Sept. 2010–June 2012 **Graduate Student**, *UCSD*, San Diego, CA, CogSci Dept.; PI: Dr. Angela Yu.
Utilizing Bayesian statistics and stochastic control theory, developed a normative account for visual perceptual decision-making with multiple alternatives. Experimentally tested model predictions.

Sept. 2010–Aug. 2011 **Research Assistant**, *UCSD*, San Diego, CA, CogSci Dept.; PI: Dr. Angela Yu.
Used MATLAB and Python to create a series of psychophysical experiments, analyze subject behavior, and quantitatively compare human behavior against computational models

Sept. 2010–June 2011 **Research Assistant**, *UCSD*, San Diego, CA, CogSci Dept.; PI: Dr. Ed Hutchins.
Assisted in converting a MATLAB suite of informational measures to Python to investigate sensorimotor data in multi-agent interactions

May 2010–August 2010 **Research Assistant**, *CMU*, Pittsburgh, PA, Computer Science Dept.; PI: David Touretzky.
Established a new high school level curriculum on cognitive robotics and evaluated its success in the classroom. Conducted a gesture analysis to understand how high schoolers conceptualize state machines

Jan. 2005–May 2006 **Research Assistant**, *IU*, Bloomington, IN, PI: Dr. Olaf Sporns.
Focused on the study of embodied robotics and its applications by employing a MATLAB suite of informational measures to study sensorimotor coordination in a robotic platform

Aug. 2004–May 2005 **Research Assistant**, *IU*, Bloomington, IN, PI: Dr. Fritz Lieber.
Assisted in conducting an ethnographic study of a Freshman Academic Residence Hall that integrated classroom instruction, field-based research, and service learning

Teaching & Advising

Teaching

Spring 2015 **Instructor**, *COGS 8: Hands-On Computing*, UCSD.

Fall 2014 **Instructor**, *COGS 8: Hands-On Computing*, UCSD.

Summer 2011 **Instructor**, *Awesome Python Experience*, UCSD, with Jamie Alexandre.

Summer 2010 **Instructor**, *Advanced Robotics*, Andrew's Leap @ CMU, with Dr. Touretzky.

Summer 2010 **Instructor**, *Robotics II*, SAMS @ CMU, with Dr. Touretzky.

2007-2008 **Instructor**, *Grades 9 & 10 Mathematics*, Matema Beach Secondary School, TZ.

Summer 2014 **TA**, *COGS 109: Modeling and Data Analysis*, UCSD, with He Huang.

Summer 2014 **TA**, *COGS 102A: Distributed Cognition*, UCSD, with Dr. Johnson.

Spring 2014 **TA**, *COGS 8: Hands-On Computing*, UCSD, with Dr. Hutchins.

Spring 2013 **TA**, *COGS 8: Hands-On Computing*, UCSD, with Dr. Hutchins.

Winter 2012 **TA**, *COGS 109: Modeling and Data Analysis*, UCSD, with Dr. de Sa.

Fall 2011 **TA**, *COGS 102A: Distributed Cognition*, UCSD, with Dr. Hutchins.

Spring 2011 **TA**, *COGS 17: Neurobiology of Cognition*, UCSD, with Dr. Johnson.

Fall 2010 **TA**, *COGS 1: Introduction to Cognitive Science*, UCSD, with Dr. Bergen.

2004-2005 **TA**, *U206: The Nature of Community*, IU, with Dr. Lieber.

August 2004 **TA**, *F401: Memory and Community*, IU, with Dr. Lieber.

Winter 2015 **Guest Lecturer**, *COGS 1: Introduction to Cognitive Science*, UCSD, with Dr. Boyle.

Winter 2015 **Guest Lecturer**, *COGS 91: SCANS presents The Social Brain*, UCSD, with Dr. Saygin.

Fall 2014 **Guest Lecturer**, *COGS 109: Modeling and Data Analysis*, UCSD, with He Huang.

Fall 2014 **Guest Lecturer**, *COGS 1: Introduction to Cognitive Science*, UCSD, with Dr. Tu.

Summer 2014 **Guest Lecturer**, *COGS 109: Modeling and Data Analysis*, UCSD, with He Huang.

Summer 2014 **Guest Lecturer**, *COGS 102A: Distributed Cognition*, UCSD, with Dr. Johnson.

Spring 2014 **Guest Lecturer**, *COGS 1: Introduction to Cognitive Science*, UCSD, with Dr. Amsel.

Winter 2014 **Guest Lecturer**, *COGS 143: Animal Cognition*, UCSD, with Dr. Johnson.

Winter 2014 **Guest Lecturer**, *COGS 1: Introduction to Cognitive Science*, UCSD, with Dr. Deak.

Summer 2013 **Guest Lecturer**, *Introduction to Python*, UCSD, Cognitive Science Bootcamp.

Summer 2012 **Guest Lecturer**, *Introduction to Python*, UCSD, Cognitive Science Bootcamp.

Winter 2012 **Guest Lecturer**, *COGS 160: Neural Coding in Sensory Systems*, UCSD, with Dr. Yu.

Spring 2011 **Guest Lecturer**, *COGS 160: Neural Coding in Sensory Systems*, UCSD, with Dr. Yu.

Spring 2011 **Guest Lecturer**, *COGS 17: Neurobiology of Cognition*, UCSD, with Dr. Johnson.

Spring 2010 **Invited Speaker**, *Life in Tanzania*, Metro Academic and Classical High School International Baccalaureate Spring Speaker Series.

October 2008 **Guest Lecturer**, *Mathematics Education in the Tanzanian Classroom*, U.S. Peace Corps Preservice Training, TZ.

Advising

2014-2015 **Graduate Student Advisor**, *Undergraduate Honors Thesis*, of Danielle Jacques.

2013-2014 **Graduate Student Advisor**, *Undergraduate Honors Thesis*, of Ashley Reese.
2013-2014 **Graduate Student Advisor**, *Undergraduate Honors Thesis*, of Rebecca Roseman.
2010-2011 **Graduate Student Advisor**, *Baginski Scholar Project*, of Ben Nuttle.

Publications and Presentations

Articles and Commentaries

(in prep) Kelleen Inglett, Christine Johnson, Jeremy Karnowski, The use of social space with respect to rank: a look into female African elephant behavior (Loxodonta africana), Zoo Biology.

November 2014 Arik Kershenbaum, Dan Blumstein, Marie Roch, ... , Jeremy Karnowski, et al., Acoustic sequences in non-human animals: A tutorial review and prospectus, Biological Reviews.

January 2014 Jeremy Karnowski, Modeling Collaborative Coordination Requires Anthropological Insights, topiCS.

Refereed Conference Publications

January 9, 2015 Jeremy Karnowski, Edwin Hutchins, Christine Johnson, *Dolphin detection and tracking*, WACV, 1st Workshop on Automated Analysis of Video Data for Wildlife Surveillance, Waikaloa Beach, HI.

May 11, 2011 Jeremy Karnowski, David Touretzky, *A New Set of Eyes and a New Pair of Legs: A Robust Learning Environment for Advanced High School Robotics*, FLAIRS 24, Palm Beach, FL.

June 2, 2010 Olaf Sporns, Jeremy Karnowski, Max Lungarella, *Mapping Causal Relations in Sensorimotor Networks*, ICDL 5, Bloomington, IN.

Presentations

May 2014 Jeremy Karnowski, *Methods for Analyzing Dolphin Video and Audio*, UCSD Cognitive Science Reunion, San Diego, CA.

April 2014 Jeremy Karnowski, *Bottlenose Dolphin Signature Whistles during Isolations and Reunions*, CARTA Student Symposium, San Diego, CA.

July 2013 Jeremy Karnowski, Edwin Hutchins, *Learning complementary action with differences in goal knowledge*, 5th Joint Action Meeting, Berlin, Germany.

April 2006 Jeremy Karnowski, *Applications of Information Theory to the Analyzation of Robotic Behavior*, Undergraduate Honors Thesis, Bloomington, IN.

Posters

April 2014 Jeremy Karnowski, Edwin Hutchins, Christine Johnson, *Vocalizations in social interactions among captive dolphins*, Indiana University Animal Behavior Conference, Bloomington, IN.

October 2013 Jeremy Karnowski, Edwin Hutchins, Christine Johnson, *Situating Dolphin Vocalizations in Social Context: Understanding an Alien Communication System*, NIMBioS Workshop on Analyzing Animal Vocal Communication Sequences, Knoxville, TN.

August 2013 Jeremy Karnowski, Edwin Hutchins, *Learning complementary action with differences in goal knowledge*, 35th Annual Meeting of the Cognitive Science Society (CogSci), Berlin, Germany.

October 2004 Fritz Lieber, Jeremy Karnowski, *A Learning Environment for the Freshman Year: Integration of Classroom Instruction, Field-Based Research and Service Learning in a Freshman Academic Residence*, ISSOTL 1, Bloomington, IN.

Professional Service

2015 **Chair**, *iSLC Conference*.

2013, 2014 **Reviewer**, *TDLC Small Grant*.

2013 **Organizer**, *iSLC Conference Workshop on Modeling the Education Process*.

2012 **Reviewer**, *IEEE Conference on Development and Learning, and Epigenetic Robotics.*

Department and University Service

2014-2015 Cognitive Science Head TA

2012-2014 Co-coordinator of the Distinguished Speaker Series

2011-2015 Served as mentor in department peer mentorship program

2012, 2013 UCSD Triton Day

2012, 2013 San Diego Brain Bee

2011-2012 Department student representative to the faculty

2006 Rechartered university chapter of mathematics honor society Pi Mu Epsilon

2005-2006 Founded department mathematics club and organized undergraduate lecture series

Awards and Funding

2014 SeaBASS Graduate Bioacoustics Summer School (Funded)

2014 Cognitive Science Travel Grant

2013 TDLC Small Grant, $2500

2013 NIMBioS Short Term Visit Grant

2013 Cognitive Science Travel Grant

2012 TDLC Small Grant, $1500

2012 iSLC Conference 2013 (Funded)

2012 CARTA Fellowship in Anthropology

2011 MLeXAI Travel Grant: Machine Learning Experiences in Artificial Intelligence

2011 UCLA IPAM Graduate Summer School: Probabilistic Models of Cognition (Funded)

2011 Cognitive Science Travel Grant

2010 Jacobs Fellow

2010 Dean's Fellowship

2010 Glushko Fellowship

2006 Cognitive Science Departmental Honors

2006 Mathematics Departmental Honors

2006 Outstanding Achievement Award: Awarded every two years to one student for outstanding coursework and research

2006 Pi Mu Epsilon

2005 Phi Beta Kappa: Inducted as a junior

2005 & 2006 Thelma Abell Prize: Awarded for outstanding mathematics achievement

2005 Hutton Honors College Research Grant: Summer funding paid to pursue independent research in undergraduate thesis work

2002-2006 IU Faculty Awards

2002-2006 Hutton Honors College Scholarships

1999 Eagle Scout

Work Experience

Feb. 2009–Apr. 2010 **Post-9/11 GI Bill Subject Matter Expert**, *Department of Veterans Affairs*, St. Louis, MO.

Gave presentations on better claims processing methods to the Undersecretary for VA Benefits, Deputy Undersecretary for Field Operations, the VA Chief of Staff, a delegation from the United States Senate, and a delegation from the White House. Created several macros to automate certain processes and save thousands of tax-payer dollars.

Sept. 2006 - Nov. 2008 **Secondary School Mathematics Educator**, *U.S. Peace Corps / Ministry of Education and Vocational Training, United Republic of Tanzania*, Matema, TZ.

Restructured school schedules, redesigned course curricula, created and proctored mock national examinations, conducted teachers' meetings and students' assemblies (using English or Swahili), developed new educational methods, and instituted new extracurricular activities.

Aug. 2005 **Program Assistant**, *Indiana University Intensive Freshman Seminars*, Bloomington, IN.

Served as administrative coordinator of program and event staff and facilitated educational programs