

Felix A. Sosa

Cambridge, MA

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Education

Harvard University

PH.D. COGNITIVE SCIENCE
Department of Psychology

Cambridge, MA
July 2019 - Present

Harvard University

S.M. COMPUTER SCIENCE
School of Engineering and Applied Sciences

Cambridge, MA
July 2019 - Present

University of Central Florida

B.S. COMPUTER SCIENCE WITH DISTINCTION
Department of Computer Science & Electrical Engineering

Orlando, FL
Fall 2011 - Spring 2018

Research & Training Courses

MIT & Marine Biological Laboratory

BRAINS, MINDS, AND MACHINES ADVANCED RESEARCH TRAINING COURSE

Woods Hole, MA
Aug 8 - Aug 29 2019

Fellowships & Awards

2019	Harvard Travel Award	Cambridge, MA
2019	NeurIPS Travel Award	Vancouver, BC
2019	Harvard Stimson Award	Cambridge, MA
2019	Invited to Sigma Xi Research Honor Society	Triangle Park, NC
2019	Society for Philosophy and Psychology Travel Award	San Diego, CA
2019	MIT & Marine Biological Laboratory Brains, Minds, and Machines Training Course Fellowship	Woods Hole, MA
2019	National Science Foundation Graduate Research Fellowship Honorable Mention	Alexandria, VA
2019	Harvard Graduate Prize Fellowship	Cambridge, MA
2018	MIT Visiting Student Fellowship in Department of Brain and Cognitive Sciences	Cambridge, MA
2017	MIT Center for Brains, Minds, and Machines Summer Research Fellowship	Cambridge, MA
2017	UCF Knight of Distinction	Orlando, FL
2017	Presenter Award, Psychological and Social Sciences, SACNAS	Salt Lake City, UT
2017	NSF LSAMP Scholarship	Orlando, FL

Experience

Computation, Cognition, and Development Lab, Harvard

GRADUATE RESEARCHER

Advisors: Tomer Ullman

Cambridge, MA
July 2019 - Present

Computational Cognitive Neuroscience Lab, Harvard

GRADUATE RESEARCHER

Advisors: Samuel Gershman

Cambridge, MA
July 2019 - Present

Center for Brains, Minds, and Machines, MIT

GRADUATE RESEARCHER

Advisors: Tomer Ullman, Samuel Gershman, Joshua Tenenbaum

Cambridge, MA
July 2019 - Present

Computational Cognitive Neuroscience Lab, Harvard

RESEARCH ASSISTANT

Advisors: Samuel Gershman

Cambridge, MA
Feb 2017 - July 2019

Computational Cognitive Science Group, MIT

RESEARCH ASSISTANT

Advisors: Joshua Tenenbaum

Cambridge, MA
Feb 2017 - July 2019

Evolutionary Complexity Lab, University of Central Florida

RESEARCH ASSISTANT

Advisors: Kenneth Stanley

Cambridge, MA

Jan 2016 - May 2018

DNA Nanotechnology Lab, University of Central Florida

RESEARCH ASSISTANT

Advisors: Dmitry Kolpashchikov

Cambridge, MA

Jan 2015 - Nov 2015

Working Manuscripts

Sosa, F.A.*, Czégel, D.*, Szathmáry, E. Evolution, Computation, and Learning. (in prep)

Sosa, F.A., Stanley, K.O. A Novel Indirect Encoding Scheme for Evolving Arbitrary Neural Networks. (in prep)

Sosa, F.A., Ullman, T., Gershman, S., Tenenbaum, J.B., & Gerstenberg, T. Moral Dynamics: Grounding moral judgment in intuitive physics and intuitive psychology. (under review)



Publications

Sosa, F.*, Ellis, K.*, Nye, M.*, Pu, Y.*, Tenenbaum, J., Solar-Lezama, A. (2019). Write, Execute, Assess: Program Synthesis with a REPL. 32nd Conference on Neural Information Processing Systems (NeurIPS)



Sosa, F.*, Ellis, K.*, Nye, M.*, Pu, Y.*, Tenenbaum, J., Solar-Lezama, A. (2019). Write, Execute, Assess: Program Synthesis with a REPL. Workshop on Multi-Task and Lifelong Reinforcement Learning at International Conference on Machine Learning (MTLRL @ ICML).



Technical Reports

Sosa, F.A., Stanley, K.O. (2018). DeepHyperNEAT: Evolving the Size and Depth of the Substrate. Evolutionary Complexity Research Reports.



Sosa, F.A.*, Ballard, T.C.*, Patel, H.K.*, Vo A.D.*, Yooseph, Shibu. (2017). Metagenomic Taxonomic Inference (MTI). UCF Electrical Engineering and Computer Science Senior Design Reports.



Presentations

Sosa, F.A.*, Ellis, K.*, Nye, M.*, Pu, Y.*, Tenenbaum, J., Solar-Lezama, A. (2019). Write, Execute, Assess: Program Synthesis With a REPL. 32nd Conference on Neural Information Processing Systems (NeurIPS 2019).

Sosa, F.A.*, Kleimen-Weiner, M.*, Gershman, S. & Cushman, F. (2019). Social learning by probabilistic program induction with execution traces. 41st Annual Meeting of the Cognitive Science Society (CogSci 2019).

Sosa, F.A., Gerstenberg, T., Ullman, T., Gershman, S., & Tenenbaum, J.B. (2019). Moral Dynamics: Grounding Moral Judgment in Intuitive Physics and Intuitive Psychology. 45th Annual Meeting of the Society for Philosophy and Psychology (SPP 2019).

Sosa, F.A., Gerstenberg, T., Ullman, T., Gershman, S., & Tenenbaum, J.B. (2018). Moral Dynamics: A Computational Model of Moral Judgment. 40th Annual Meeting of the Cognitive Science Society (CogSci 2018).

Sosa, F.A., Kleimen-Weiner, M., Levine, S., Gerstenberg, T., Ullman, T., Gershman, S., & Tenenbaum, J.B. (2018). Reverse-engineering Social and Moral Intelligence. MIT Quest for Intelligence Launch Poster Session.

Sosa, F.A., Gerstenberg, T., Ullman, T., Gershman, S., & Tenenbaum, J.B. (2017). Moral Dynamics: A Computational Model of Moral Judgment. Annual Biomedical Research Conference for Minority Students (ABRCMS 2017).

Sosa, F.A., Gerstenberg, T., Ullman, T., Gershman, S., & Tenenbaum, J.B. (2017). Moral Dynamics: A Computational Model of Moral Judgment. Society for the Advancement of Chicanos/Hispanics and Native American in Science (SACNAS 2017).

Sosa, F.A., Gerstenberg, T., Ullman, T., Gershman, S., & Tenenbaum, J.B. (2017). Moral Dynamics: A Computational Model of Moral Judgment. Center for Brains, Minds, and Machines Summer Program Showcase.

Sosa, F.A., Gerstenberg, T., Ullman, T., Gershman, S., & Tenenbaum, J.B. (2017). Moral Dynamics: A Computational Model of Moral Judgment. MIT Summer Research Program Showcase.

Sosa, F.A., Ballard, T., Patel, H., Vo, A., & Yooseph, S. (2017). Metagenomic Taxonomic Inference (MTI): Mixture Models for Relative Abundances. UCF Senior Design Showcase for Engineering and Computer Science.

Teaching

9.660/9.66/6.804: Computational Cognitive Science, MIT

Cambridge, MA

TEACHING ASSISTANT

Fall 2019

Serving as a teaching assistant for 9.660/9.66[J]/6.804[J] under Josh Tenenbaum for Fall 2019.

Evolution, Computation, and Learning, MIT

Cambridge, MA

INSTRUCTOR

Spring IAP 2019

Designed and taught a course for the 2019 MIT IAP session. Focused on the intersection of evolutionary theory and learning theory as it relates to cognitive science and AI.

Building Machines That Learn and Think Like People, MIT

Cambridge, MA

TEACHER

Fall 2018

Designed and gave a lecture for MIT's Educational Studies Program Splash! 2018. Lectured 143 high school students on reverse-engineering human intelligence through the study of computational cognitive science, neuroscience, and evolutionary computation.

Memory Wars: Views of Memory from Systems Neuroscience, MIT

Cambridge, MA

INSTRUCTOR

Spring IAP 2018

Designed and taught a course for the 2018 MIT IAP session alongside Dr. Carmen Varela focusing on memory research and experimenting with complementary ways of discussing seminal literature.

Center for Brains, Minds, and Machines Quantitative Methods Workshop, MIT

Cambridge, MA

TEACHING ASSISTANT

Spring 2017

Invited to teach 80 students from multiple minority-serving universities how to program in python to solve common problems in biology at a week-long workshop at MIT.

Introductory Topics in Artificial Intelligence, UCF

Cambridge, MA

INSTRUCTOR

Spring 2016 - Fall 2018

Founded, designed, and taught a lecture and workshop series at UCF focused on modern topics and methods in artificial intelligence for undergraduate and graduate students. The series is taught every semester with continuing participation and growth from UCF and CBMM.

Invited Talks, Lectures, & Workshops

Evolutionary Computation for the Science & Engineering of Intelligence, Harvard

Cambridge, MA

LECTURE

Fall 2019

Invited to give the first lecture for Harvard's Science of Intelligence Initiative. Covered the foundations of evolutionary computation and its importance for understanding innate cognitive abilities in children, how intelligence develops over childhood, and how to build AI that learn like children.

Center for Brains, Minds, and Machines Education Workshop - MIT

Wellesley, MA

TALK

Spring 2018

Invited to speak about my educational series on AI and machine learning to faculty at MIT, CUNY, Yale, Howard College, Wellesley College, and University of Puerto Rico. Engaged with faculty on potential means of improving pedagogies and initiatives for undergraduates studying cognitive science or artificial intelligence.

Gradient Descent, Backprop, and Deep Learning - UCF

Orlando, FL

WORKSHOP

Fall 2017

Invited to give an in-depth workshop on stochastic gradient descent, the implementation of backpropagation, and deep learning at the University of Central Florida's annual hackathon.

Introduction to Evolutionary Computation - MIT

Cambridge, MA

LECTURE

Summer 2017

Invited by MIT faculty in the Department of Brain and Cognitive Sciences to give an introductory lecture on evolutionary computation. Focused on history of the field and recent developments in neuroevolution.

Introduction to Computational Neuroscience - Melrose Science Center

Orlando, FL

LECTURE

Spring 2016

Invited by the Orlando Melrose Center to give a lecture to the public on general history and development of computational neuroscience and how the computational perspective might increase our understanding of the brain.

Brain-Computer Interfacing - Orlando Science Center

Orlando, FL

TALK

Fall 2015

Invited to speak about the development of brain-computer interfaces (BCIs) and my own work developing non-invasive BCIs to enable persons to control prosthetic devices.

Service & Outreach

Reviewing

Annual Meeting of the Cognitive Science Society (CogSci)

2019

Organizations

MEMBER, Mind, Brain, and Behavior (MBB) Graduate Steering Committee at Harvard

Fall 2019 - Present

MEMBER, Center for Brains, Minds, and Machines (CBMM) Young Trainee Leadership Council at MIT

Spring 2019 - Present

TREASURER, Society for the Advancement of Chicanos/Hispanics & Native Americans in Science (SACNAS) at UCF

Spring 2017

DIRECTOR, Association for Computing Machinery (ACM) Special Interest Group for Artificial Intelligence at UCF

Spring 2016 - Fall 2018

FOUNDER & PRESIDENT, Synthetic Biology at UCF

Spring 2015 - Spring 2016

Mentorship

MENTOR, Eureka Seedlings Mentor Program at UCF

Spring 2017 - Fall 2018

MEMBER, Student Undergraduate Research Program at UCF

Spring 2017 - Fall 2018

Public Speaking

GUEST EDUCATOR, Boston Museum of Science Health Fair

2019

KEYNOTE SPEAKER, Nerd Nite Orlando

2015, 2016, 2017, 2018

KEYNOTE SPEAKER, Orlando Science Center

2016

KEYNOTE SPEAKER, Nerd Nite Miami

2016

KEYNOTE SPEAKER, Pecha Kucha Orlando

2016

KEYNOTE SPEAKER, Orlando Maker Faire

2015

Skills

Program Languages

Python, R, Haskell, JavaScript, Lisp, C, C#, CUDA, Shell, SQL, Julia, Gen

Computation

Program Induction, Stochastic Methods, Evolutionary Computation, Probabilistic Programming

Hardware Prototyping and Design

Arduino, RedBoard, EagleCAD, PCB Design, Circuit Design, Raspberry Pi

Physics and Game Engines

Pygame, Pymunk, Blender, VGDL, Game Engine Design

Miscellaneous

Mechanical Turk, PsiTurk, Adobe Illustrator