

Manuel Arturo Deza Figueroa (Arturo Deza)

CONTACT INFORMATION	Department of Brain and Cognitive Sciences (46-5155A) Massachusetts Institute Technology (MIT) Cambridge MA, USA.	mobile: 540-449-4919 website: www.arturodeza.wikidot.com e-mail: deza@mit.edu
RESEARCH INTERESTS	Hybrid Perceptual Systems, Vision, Psychophysics, Representational Learning.	
ACADEMIC POSITIONS	Massachusetts Institute Technology (MIT), MA, USA <i>PostDoctoral Associate, Center for Brains, Minds and Machines</i> February 2020 – present <ul style="list-style-type: none">• Research Advisor: Tomaso Poggio. Harvard University, MA, USA <i>PostDoctoral Fellow, Department of Psychology</i> February 2019 – February 2020 <ul style="list-style-type: none">• Research Advisor: Talia Konkle.	
EDUCATION	University of California, Santa Barbara (UCSB), CA, USA <i>Ph.D. Dynamical Neuroscience</i> September 2013 – December 2018 <ul style="list-style-type: none">• Cumulative GPA: 3.76/4.0• Research Advisor: Miguel Eckstein. Universidad Nacional de Ingenieria (UNI), Lima, Peru <i>B.S. Mechatronics Engineering (Robotics)</i> March 2007 – December 2012 <ul style="list-style-type: none">• Summa Cum Laude. Rank: 1/45.• Research Advisor: Alberto Coronado.	
MANUSCRIPTS	<u>Deza, A., Konkle, T.</u> “Foveation induces Robustness to Scene Occlusion in Deep Neural Networks”, <i>In preparation; Abstract Submitted to VSS 2020.</i>	
	<u>Deza, A.[†], Peterson, J.C.[†], Murty, A.R.[†], Griffiths, T.[†].</u> “Shared Visual Representations for Human and Machine Intelligence (SVRHM)”, <i>In preparation.</i>	
PUBLICATIONS	<u>Deza, A., Chen, Y.-C., Long, B.L., Konkle, T.</u> “Accelerated Texforms: Alternative Methods for Generating Unrecognizable Object Images with Preserved Mid-Level Features”, <i>Conference on Cognitive Computational Neuroscience (CCN)</i> . Berlin, Germany. September 2019.	
	<u>Deza, A., Surana, A., Eckstein, M.P.</u> “Assessment of Faster-RCNN for Man-Machine Collaborative Search”, <i>IEEE Conference on Computer Vision and Pattern Recognition (CVPR)</i> . Long Beach, CA. June 2019.	
	<u>Deza, A., Jonnalagadda, A., Eckstein, M.P.</u> “Towards Metamerism via Foveated Style Transfer”, <i>International Conference on Learning Representations (ICLR)</i> . New Orleans, LA. May 2019.	
	<u>Deza, A.</u> “Peripheral Representations: From Perception to Visual Search” <i>University of California, Santa Barbara. PhD Thesis</i> . Santa Barbara, CA. December 2018.	
	<u>Deza, A., Peters, J., Taylor, G.S., Surana, A., Eckstein, M.P.</u> “Attention Allocation Aid for Visual Search”, <i>ACM Conference on Human Factors in Computing Systems (CHI)</i> , Denver, CO. May 2017.	
	<u>Deza, A., Eckstein, M.P.</u> “Can Peripheral Representations Improve Clutter Metrics on Complex Scenes?”, <i>Neural Information Processing Systems (NIPS)</i> , Barcelona, Spain, December, 2016.	
	<u>Deza, A., Parikh, D.</u> “Understanding Image Virality”, <i>IEEE Conference on Computer Vision and Pattern Recognition (CVPR)</i> , Boston, MA. June, 2015.	
PROFESSIONAL MEMBERSHIPS	Co-Organizer of the 1st Workshop of Shared Visual Representations in Human and Machine Intelligence (SVRHM) at NeurIPS 2019 with Joshua Peterson, Apurva Ratan Murty and Thomas Griffiths.	

Assigned Reviewer ICML 2020. Assigned Reviewer for ECCV 2020. Assigned Reviewer for CVPR 2020 (areas Representational Learning and Generative Models). Program Committee and Reviewer for AAAI 2020 (areas Perception and Deep Learning). Assigned Reviewer for NeurIPS 2019 (Perception, Neuroscience and Deep Learning). Assigned Reviewer for ICCV 2019 (Perception and Representational Learning). Assigned Reviewer for CVPR 2019,2020 (Computer Vision & Deep Learning). Assigned Reviewer for CASE 2019 (Robotics). Vision Sciences Society(VSS). Volunteer Reviewer for NIPS, 2016. Assigned reviewer for IUI, 2017. Program Committee of the Mutual Benefits of Cognitive and Computer Vision ICCV workshop 2017.

Organizer of the *Dynamical Neuroscience* Human and Machine Perception Fall 2016 Seminar.

ACHIEVEMENTS,
HONORS AND
AWARDS

Raised Sponsorship from DeepMind, NVIDIA, MIT's Center for Brains Minds and Machines, National Science Foundation (NSF), MIT's Quest for Intelligence, Princeton's Center for Statistics and Machine Learning and Apple towards the SVRHM workshop ~ \$16'000 2019
 Harvard Young Scientist Travel Award \$2200 2019
 UCSB President's Work Study Award \$3000 2016
 UCSB Doctoral Student Travel Grant Award \$1030 2016
 NVIDIA Best Poster Award at Scene Understanding Workshop (SUNw@CVPR) 2015
 CONCYTEC - Peruvian Science and Technology Research Grant \$1200 2013
 Invited Speaker at Peru's 4th National Neuroscience and Complex Systems Symposium, Lima 2012
 Invited Speaker at Peru's International Science Forum, Ica 2012
 Accepted at International Computer Vision Summer School (ICVSS), Sicily 2012
 Accepted at Computer Vision and Machine Learning Summer School (CVML), Grenoble 2012
 UCSB NVC Tech Start-up Competition - Finalist (2/46 Teams) \$2500 2012
 CONCYTEC - Peruvian Science and Technology Research Grant \$800 2012
 Alberto Benavides de la Quintana - Patronato UNI Research Fellowship and Award \$5400 2011
 Machine Learning Summer School Programming Competition (2/50) 2011
 President of the Artificial Intelligence Student Research Group (GISCIA) Lima, Peru. 2011,2012
 Top 10 Mechatronics Engineering GPA of all ME Department (8/1200) 2008,2011
 1st place in University Admissions exam to Mechatronics Engineering program - IB Mode 2007
 Certificate of Originality and Initiative, given by the Latin American Heads Conference 2006

SOFTWARE

Deza, A., Akbas, E., Eckstein, M.P. "Piranhas Toolkit: Peripheral Architectures for Natural, Hybrid and Artificial Systems", *GitHub*. 2016.

TALKS, ESSAYS
AND POSTER
SESSIONS

Deza, A. "Exploring the role of Foveation in Deep Neural Networks", *Invited talk at NVIDIA Research*, Santa Clara, CA. October, 2019.

Deza, A. "Towards Metamerism via Foveated Style Transfer", *Invited talk at Google Brain and Machine Perception*, Mountain View, CA. January, 2019.

Deza, A. "Towards Metamerism via Foveated Style Transfer", *Invited talk at Columbia University's Zuckerman Institute*, New York, NY. October, 2018.

Deza, A. "Peripheral Representations for Human and Machine Perception", *Invited talk at the Vision Sciences Lab at Harvard University*, Cambridge, MA. October, 2018.

Deza, A. "Peripheral Representations for computational models of Human and Machine Perception", *Invited talk at the Redwood Center for Theoretical Neuroscience of UC Berkeley*, Berkeley, CA. March, 2018.

Deza, A. "Peripheral Representations for Artificial Perception", *Invited talk at the Rosenholtz Lab. Given at the Computer Science and Artificial Intelligence Laboratory (CSAIL) MIT*, Cambridge, MA. August, 2017.

Deza, A., Eckstein, M.P. "Peripheral Representations Enhance Dense Clutter Metrics in Free Search", *Vision Sciences Society (VSS) Talk*, St. Petersburg, FL. May, 2017.

Surana, A., Peters J., Deza, A., Taylor, G.S., Bertucelli, L., Leonardi, F., Eckstein, M.P. “Optimal User Attention Allocation in a Multi-tasking Environment”, *American Controls Conference (ACC) Workshop Talk, 2016.*

Deza, A., Taylor, G.S., Eckstein, M.P. “The Influence of Visual Clutter on Search Guidance with Complex Scenes”, *Vision Sciences Society (VSS) Talk, St. Petersburg, FL. May, 2016*

Eckstein, M.P., Deza, A., Akbas, E. “Spatial Attention with synthetic cues and real scenes”, *Cosyne Talk, Salt Lake City, Utah. February, 2016*

Deza, A., Akbas, E., Eckstein, M.P. “Scene context reduces distractor set-size effects during search”, *Vision Sciences Society (VSS) Poster, St. Petersburg, FL. May, 2015*

Deza, A., Jammalamadaka, A., Manjunath, B.S. “Vesselshift: A mean-shift based method for neurite tracing”, *Technical Report, 2013*

PROGRAMMING &
SOFTWARE

Python, PyTorch, Lua (Torch), MATLAB, PsychToolbox (psychophysics + Eye-tracking), C++, C#, Linux shell scripting, OpenCV and OpenGL libraries, Microsoft XNA framework, L^AT_EX 2_ε, Amazon Mechanical Turk.

RESEARCH
EXPERIENCE

Harvard University, Cambridge, MA. United States

Vision Sciences Lab

February 2019 – February 2020

I worked with Prof. Talia Konkle on exploring the functional role of foveation in deep neural networks, which is work to be submitted to ICML (International Conference on Machine Learning). In addition to the former project, we ventured on a project that increased the rendering speed and resolution of texforms (objects that have low-level information removed and mid-level information preserved).

University of California, Santa Barbara, Santa Barbara, CA, United States

Vision and Image Understanding Lab

September 2013 – December 2018

I worked with Prof. Miguel Eckstein on hybrid human-computer vision object recognition and perceptual models applied to visual search in scenes.

Institute for Collaborative Biotechnologies, Santa Barbara, CA, United States

Brain Sciences and Mechanical Engineering Departments

July 2014 – December 2018

I worked with Prof. Miguel Eckstein, Amit Surana from UTRC, and Prof. Francesco Bullo (Mechanical Engineering) on a hybrid human-computer vision object recognition system for optimizing visual search in aerial images.

Virginia Tech, Blacksburg, VA, United States

Computer Vision Lab

January 2013 – November 2013

I worked on image virality with Prof. Devi Parikh, this work concluded in our CVPR '15 paper. Work was started long distance from Peru. I stayed in Virginia from April-July 2013.

University of California, Santa Barbara, Santa Barbara, CA, United States

Center for Bio-Image Informatics

February 2012 – July 2012

I worked on the neuron tracing problem, where I designed a new tracing algorithm dubbed “Vesselshift”, that with a simple MST connectivity approach produced state-of-the-art results benchmarked with the DIADEM Challenge. Work was done under the supervision of Prof. Manjunath.

Universidad Nacional de Ingenieria, Lima, Peru

Digital Image Processing Course Project

September 2011 – December 2011

I created a representative Google Earth satellite images database to analyze different socioeconomic regions of Lima, Peru. Different low level and mid level data was processed to estimate urban and rural development. Matlab code and image database is uploaded on personal webpage.

PROFESSIONAL
EXPERIENCE

United Technologies Research Center (UTRC), Hartford, Connecticut

Deep Learning Intern

June 2017 – September 2017

I worked on a project using Generative Adversarial Networks and Sequence-to-Sequence learning applied to Time Series data forecasting. Work was done under supervision of Kishore Reddy.

Gifiniti - Start-up Company, Santa Barbara, California

Software Developer

January 2012 – May 2012

I worked on front-end and back-end web development of Gifiniti : a recommendation system that fetches personal information from Facebook and Google to help you give that special person the 'right' gift. Gifiniti won 2nd place at UCSB's NVC Startup competition, receiving a \$2500 prize.

TEACHING
EXPERIENCE

Advanced Research Methods, Santa Barbara, California

Teaching Assistant

April 2017 – June 2017

I supervised 4 groups of 5 students each during the class where the goal was to have each group present a poster at the end of the quarter about a research project they developed. Each group came up with a hypothesis, designed a study, and wrote up a paper that summarized their results.

Perception Lab, Santa Barbara, California

Teaching Assistant

April 2015 – June 2015

I was a Lab TA for a Psychophysics course at UCSB for upperclassmen. I was in charge of TA'ing one section of 8 students.

Introduction to Statistics, Santa Barbara, California

Teaching Assistant

January 2015 – March 2015

I was lecturing on basic principles of Inferential and Descriptive Statistics at UCSB at the undergraduate level. I was in charge of TA'ing one section of 30 students.

Introduction to Psychology, Santa Barbara, California

Teaching Assistant

October 2014 – December 2014

I lectured 4 sections about basic principles in Psychology as a T.A at UCSB at the undergraduate level. The total number of students enrolled in the class was 840. I was in charge of TA'ing 120.

PROFESSIONAL
ACTIVITIES

Talks, 2011-2016

- *Foveated Models of Clutter Perception, 2016. Lima, Peru.*

Given at the Institute for Mathematics and Applied Sciences (IMCA); at the Mechanical Engineering Department of UNI; at the National Institute of Telecommunications (INICTEL).

- *Re-evaluating the Mechatronics Engineering major in Peru, 2015. Lima, Peru.*

Given at the Mechanical Engineering Departments of UNI.

- *Applying for a PhD in Vision as an international student, 2013,2014. Lima, Peru.*

Given at the Mechanical Engineering Departments of UNI.

- *How to get international research opportunities, 2012. Lima, Peru.*

Given at the Physical Science and Mechanical Engineering Departments of UNI.

- *Perspectives on AI and Neuroinformatics, 2012. Lima, Peru.*

Given at the Physical Science Department of UNI & Peru's National Air and Space Research Center.

- *Why you should pursue a career in Science and Engineering, 2011-2012. Lima, Peru.*

I give this talk twice a year to public high schools and private magnet academy's in Lima, Peru.

PhD level Research Summer Schools, 2011-2012

- Machine Learning Summer School 2011, MLSS - Purdue University. Indianapolis, USA.

- Visual Recognition and Machine Learning Summer School, VRML - INRIA. Grenoble, France.

- International Computer Vision Summer School, ICVSS - University of Catania. Sicily, Italy.

Teaching and Research Mentoring, 2011-2012. Lima, Peru.

Weekly meetings with Sophomore's and Junior's that were interested in doing research in Computer Vision and Machine Learning. Meetings were held at GISCIA - research lab. This was a research lab ran purely by undergraduates at the Universidad Nacional de Ingenieria. I served as President from 2011 to 2012. Group Website and Projects: <http://giscia.github.io/people/>

Media, 2012-2013

- Interview on ProUNI quarterly magazine about personal research on Computer Vision, 2012
- Interview on SanBorja Radio's science program about research on Neuroinformatics, 2012
- Fulbright article on Peru's graduate students in the spotlight, 2013
- CONCYTEC article on Peru's graduate students in the spotlight, 2013

Community Service, 2010-2012

Squad leader and captain of multiple activities at Un Techo Para Mi Pais (UTPMP), a Latinamerican NGO similar to Engineers Without Borders(EWB). My squad has built a total of 3 wooden houses for homeless families and raised \$1'000 at each years fund raising rally.

International Research Outreach, 2010-2012

I post online guides, links, screencasts and ideas on how research should be conducted for undergraduates who are studying in developing countries on my research blog: www.arturodeza.wikidot.com/data-log. Most of my activity has transferred to Quora: www.quora.com/Arturo-Deza

HOBBIES AND
EXTRA'S

Surfing, painting, piano, running, creative writing.