

NATANIEL RUIZ

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RESEARCH INTERESTS

Machine learning and computer vision.

EDUCATION

Ph.D. Candidate, Boston University , Boston, MA Ph.D. Candidate in Computer Science Advisor: Prof. Stan Sclaroff Research Group: Image and Video Computing	GPA :	4.0 / 4.0	(expected) 2018 - 2022
M.Sc., Georgia Institute of Technology , Atlanta, GA M.Sc. in Computer Science (Specializing in Machine Learning) Advisor: Prof. James M. Rehg Research Group: Behavioral Imaging	GPA :	3.90 / 4.0	2016 - 2017
B.Sc. / M.Sc., Ecole Polytechnique , Paris, France <i>N°1 Ranked French Grande Ecole in Science and Technology</i> Bachelor of Science & Master of Science in Data Science	Graduate GPA :	3.86 / 4.0	2013 - 2016
Lycée Jean-Baptiste Say , Paris, France <i>N°1 Ranked Program in Physics, Technology and Industrial Science.</i> 2-year intensive preparation in Mathematics and Physics for the nationwide entrance examinations to top French Engineering Schools. One of 13 students accepted to Ecole Polytechnique out of 2,000 from my academic track.	GPA :	3.80 / 4.0	2011 – 2013

PUBLICATIONS

[Paper, ICLR 2019]

Nataniel Ruiz, Samuel Schuster, Manmohan Chandraker. "Learning To Simulate" *International Conference on Learning Representations (ICLR) (2019)*

[Paper, Arxiv 2018]

Meera Hahn, **Nataniel Ruiz**, Jean-Baptiste Alayrac, Ivan Laptev, James M Rehg. "Learning to Localize and Align Fine-Grained Actions to Sparse Instructions." *arXiv preprint arXiv:1809.08381* (2018)

[Paper, ECCV 2018]

Eunji Chong, **Nataniel Ruiz**, Yongxin Wang, Yun Zhang, Agata Rozga, James M. Rehg. "Connecting Gaze, Scene, and Attention: Generalized Attention Estimation via Joint Modeling of Gaze and Scene Saliency." *The European Conference on Computer Vision (ECCV)*, 2018, pp. 383-398

[Paper, CVPRW 2018]

Nataniel Ruiz, Eunji Chong, and James M. Rehg. "Fine-Grained Head Pose Estimation Without Keypoints." In *Proceedings of the IEEE Conference on Computer Vision and Pattern Recognition Workshops*, pp. 2074-2083. 2018 **(Oral)**

[Paper, UBICOMP 2017, IMWUT 2017]

Eunji Chong, Katha Chanda, Zhefan Ye, Audrey Southerland, **Nataniel Ruiz**, Rebecca M. Jones, Agata Rozga, and James M. Rehg. "Detecting Gaze Towards Eyes in Natural Social Interactions and Its Use in Child Assessment." *Proceedings of the ACM on Interactive, Mobile, Wearable and Ubiquitous Technologies* 1, no. 3 (2017): 43 **(Oral and Distinguished Paper Award - 3% award rate)**

[Paper, Arxiv 2017]

Nataniel Ruiz, and James M. Rehg. "Dockerface: an Easy to Install and use Faster R-CNN Face Detector in a Docker Container." *arXiv preprint arXiv:1708.04370* (2017)

AWARDS

Dean's Fellowship (2018-2019), Boston University

Outstanding Leadership Award (2016, 2% award rate), Ecole Polytechnique

Excellence-Major (Valedictorian) Scholarship (2011-2016), French Government

RESEARCH EXPERIENCE

Apple AI Research, Cupertino, CA

(Upcoming) May 2019 - August 2019

Research Assistant Intern

- Will be working under **Dr. Nick Apostoloff** and **Dr. Barry Theobald** on facial analysis methods in computer vision.

Boston University, Boston, MA

September 2018 - Present

Research Fellow

- Working under **Prof. Stan Sclaroff** on computer vision and machine learning methods for an intelligent tutor which interacts with students to improve learning outcomes through facial analysis.

NEC Laboratories America, Inc, Cupertino, CA

February 2018 - August 2018

Research Assistant Intern

- Worked under **Dr. Manmohan Chandraker** and **Dr. Samuel Schulter** on topics related to self-driving car perception, visual data simulation and reinforcement learning.

Georgia Institute of Technology, Atlanta, GA

December 2016 – December 2017

Graduate Research Assistant

- Worked under **Prof. James Rehg** on facial analysis, first person vision and mobile computer vision.
- Co-authored **four papers**, **one tech-report** and released **three open-source** computer vision applications in 2017 while taking a full-time course load.

MIT CSAIL, Cambridge, MA

May 2016 – August 2016

Visiting Research Assistant

- Worked under **Dr. Lalana Kagal** and **Dr. Kalyan Veeramachaneni**.
- Built a TensorFlow application on Android for visual detection of diseases in cassava plant leaves using deep learning.
- Deployed the application in Kampala, Uganda alongside collaborators from Makerere University.

SELECTED PROJECTS

1,000+ stars on original machine learning GitHub repositories at github.com/natanielruiz

Deep Learning Head Pose Estimation

- Head pose estimation deep neural network bundled with pre-trained models.

Android-YOLO

- Open source real-time object detection deep learning system on an Android device.

Dockerface

- Open source deep learning face detection in a Docker container.

Extended GTEA Gaze+ Dataset

- Co-lead the annotation of a large open-access egocentric vision action recognition dataset. [1]

Udacity Lecture

- Authored an online lecture for Prof. James M. Rehg on Facial Landmark Detection to be released by Georgia Tech on the Udacity platform.

LEADERSHIP & AFFILIATIONS

TEDxEcolePolytechnique, Ecole Polytechnique

2014 – 2016

President and founder

- Founded and organized the first TEDx conference at Ecole Polytechnique.
- Recruited and managed the 2015 and 2016 student teams.

Entrepreneurship Student Society, Ecole Polytechnique

2014 – 2016

Speaker & Startup Relations Manager

- Organized the first Startup Showcase and job fair at Polytechnique.
- Obtained the participation of over ten startups for the Startup Showcase.
- Obtained the participation of entrepreneur coaches and a panel of senior entrepreneur judges for the Startup Weekend event.

SELECTED GRADUATE COURSEWORK

Boston University

Deep Learning (CS 591)

Georgia Institute of Technology

Machine Learning (CS 7641), Computer Vision (CS 6476), Advanced Computer Vision (CS 7476), Natural Language (CS 7650), Data and Visual Analytics (CS 6476), Knowledge Based AI (CS 7637)

Ecole Polytechnique

Statistical Learning and Non-Parametric Estimation (MAP 553), Machine Learning (INF 582), Operations Research (MAP 557)

REVIEWER

2017 IEEE Conference on Computer Vision and Pattern Recognition (CVPR)

2018 IEEE Transactions on Neural Networks and Learning Systems (TNNLS)

2019 IEEE Transactions on Neural Networks and Learning Systems (TNNLS)

TALKS AND PRESENTATIONS

Oral and Poster - 2019 **Distinguished Presenter** and **Brilliant Bud Award** at 4th Annual BU Data Science (BUDS) Day

Oral Presentation - 2019 Boston University AIR Retreat

Invited Lecturer - 2019 KPMG Bolivia Machine Learning Tutorial

Oral Presentation - 2018 NEC Labs Summer Intern Presentation

Oral and Poster - 2018 IEEE Conference on Computer Vision and Pattern Recognition Workshop (CVPRW)

RESEARCH MENTORSHIP

Yongxin Wang (B.S. in C.S., 2017, Georgia Tech) - now M.Sc. student, Computer Vision at Carnegie Mellon University

Vaishali Sarathy (M.Sc. in C.S., 2017, Georgia Tech) - now at Schlumberger

SKILLS AND LANGUAGES

Python, C++, Java, Matlab – PyTorch, TensorFlow, scikit-learn – GNU/Linux, bash – SQL – some Android, HTML, PHP.

Fluent in English, French and Spanish.

LINKS AND REFERENCES

All papers, pre-prints and code can be found at natanielruiz.github.io

TEDxEcolePolytechnique: <https://www.tedxecolepolytechnique.com/>

Ecole Polytechnique Entrepreneurship Society: <https://www.cabinetstartup.fr/>

[1] Extended GTEA Gaze+: <http://cbi.gatech.edu/fpv/>