NATANIEL RUIZ

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RESEARCH INTERESTS

Machine learning and computer vision.

EDUCATION

Ph.D. Candidate, Boston University, Boston, MA — GPA : 4.0 / 4.0 — (expected) 2018 - 2022
Ph.D. Candidate in Computer Science
Advisor: Prof. Stan Sclaroff
Research Group: Image and Video Computing

M.Sc., Georgia Institute of Technology, Atlanta, GA — GPA : 3.90 / 4.0 — 2016 - 2017
M.Sc. in Computer Science (Specializing in Machine Learning)
Advisor: Prof. James M. Rehg
Research Group: Behavioral Imaging

B.Sc. / M.Sc., Ecole Polytechnique, Paris, France — Graduate GPA : 3.86 / 4.0 — 2013 - 2016
N°1 Ranked French Grande Ecole in Science and Technology
Bachelor of Science & Master of Science in Data Science

Lycée Jean-Baptiste Say, Paris, France — GPA : 3.80 / 4.0 — 2011 – 2013
N°1 Ranked Program in Physics, Technology and Industrial Science.
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 (0.6% acceptance rate).

PUBLICATIONS

[Paper, ICLR 2019]
Nataniel Ruiz, Samuel Schulter, 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:1*809.08381 (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 May 2019 - August 2019
Research Assistant Intern
- Will be working with **Dr. Nick Apostoloff** and **Dr. Barry Theobald** on facial analysis, generative models and simulation.

Boston University, Boston, MA September 2018 - Present
Research Fellow
- Working with **Prof. Stan Sclaroff**, **Prof. Margrit Betke** and **Dr. Vitaly Ablavsky** on topics related to facial analysis, behavioral imaging and simulation.

NEC Laboratories America, Inc, Cupertino, CA February 2018 - August 2018
Research Assistant Intern
- Worked with **Prof. Manmohan Chandraker** and **Dr. Samuel Schulter** on topics related to self-driving car perception, visual data simulation and reinforcement learning. **One paper accepted to ICLR** on the topic of learning to simulate.

Georgia Institute of Technology, Atlanta, GA December 2016 – December 2017
Graduate Research Assistant
- Worked with **Prof. James Rehg** on facial analysis, behavioral imaging, first person vision and mobile computer vision.
- Co-authored **five papers** and released **three open-source** computer vision applications in 2017 while taking a full-time course load.

Massachusetts Institute of Technology, Cambridge, MA May 2016 – August 2016
Visiting Research Assistant (funded by a Bill and Melinda Gates Foundation Grant)
- Worked with **Dr. Lalana Kagal** and **Dr. Kalyan Veeramachaneni** building a deep learning application on Android for visual detection of diseases in cassava plant leaves. Deployed the application on the field in Kampala, Uganda.

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 - 2019 Boston University AIR Keynote
Oral and Poster - 2019 **Distinguished Presenter** and **Brilliant 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/