

# NATANIEL RUIZ

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## RESEARCH INTERESTS

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Machine learning and computer vision.

## EDUCATION

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<b>Ph.D. Candidate, Boston University</b> , Boston, MA Ph.D. Candidate in Computer Science Advisor: Prof. Stan Sclaroff Research Group: Image and Video Computing	GPA :	TBD	(expected) 2018 - 2022
<b>M.Sc., Georgia Institute of Technology</b> , 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>B.Sc. / M.Sc., Ecole Polytechnique</b> , 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
<b>Lycée Jean-Baptiste Say</b> , 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

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### [Paper, In Submission ICLR 2019]

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

### [Paper, In Submission WACV 2019]

Meera Hahn, **Nataniel Ruiz**, Jean-Baptiste Alayrac, Ivan Laptev, James M Rehg. "Learning to Localize and Align Fine-Grained Actions to Sparse Instructions." In submission to *IEEE Winter Conference on Applications of Computer Vision (WACV) (2019)*

### [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

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**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

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**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

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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

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**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.

*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

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### **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

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

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

## RESEARCH MENTORSHIP

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

Vaishali Sarathy (M.Sc. in C.S., 2017) - Schlumberger

## SKILLS AND LANGUAGES

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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

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All papers, pre-prints and code can be found at [natanielruiz.github.io](https://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/>