

# NATANIEL RUIZ

[nruiz9@bu.edu](mailto:nruiz9@bu.edu) | [natanielruiz.github.io](https://natanielruiz.github.io) | [github.com/natanielruiz](https://github.com/natanielruiz)

## 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. <ul style="list-style-type: none"><li>One of thirteen students accepted to Ecole Polytechnique out of two thousand from my academic track.</li></ul>	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) (2018)*

### [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) (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.

### [Paper, UBICOMP 2017 and 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.

### [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**.

**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]

## 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.

**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

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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)

## 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/>