

# NATANIEL RUIZ

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## 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 : 4.0 / 4.0	(expected) 2018 - 2022
<b>M.Sc., Georgia Institute of Technology</b> , Atlanta, GA M.Sc. in Computer Science 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 Grande Ecole entrance examinations. Admitted to Ecole Polytechnique (0.6% acceptance rate).	GPA : 3.80 / 4.0	2011 – 2013

## AWARDS

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**Twitch Research Fellowship Finalist** (2020), Twitch

**Second Round for the Open Phil AI Fellowship** (2020), Open Philanthropy

**DeepMind Travel Award** (2020), Conference on Computer Vision and Pattern Recognition (CVPR)

**Travel Award** (2019), International Conference on Learning Representations (ICLR)

**Distinguished Presenter and Brilliant Award** (2019), 4th Annual Boston University Data Science Day

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

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

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

## PUBLICATIONS

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### [Paper, BAYLEARN 2020 and In Submission]

**Nataniel Ruiz**, Sarah Adel Bargal, Stan Sclaroff. "Protecting Against Image Translation Deepfakes by Leaking Universal Perturbations from Black-Box Neural Networks" *Bay Area Machine Learning Symposium* (2020) and *Under Review for Conference* (2020)

### [Paper, CVPRW 2020 and ECCV 2020 Workshop]

**Nataniel Ruiz**, Sarah Adel Bargal, Stan Sclaroff. "Disrupting DeepFakes: Adversarial Attacks Against Conditional Image Translation Networks and Facial Manipulation Systems" *CVPR 2020 Workshop on Adversarial Machine Learning in Computer Vision* (2020) **(Oral)** and *European Conference on Computer Vision (ECCV) Workshop* (2020)

### [Paper, CVPR 2020]

Eunji Chong, Yongxin Wang, **Nataniel Ruiz**, James M. Rehg. "Detecting Attended Visual Targets in Video" *The IEEE Conference on Computer Vision and Pattern Recognition (CVPR)* (2020)

### [Paper, NECV 2019 and In Submission]

**Nataniel Ruiz**, Mona Jalal, Vitaly Ablavsky, Danielle Allessio, John Magee, Jacob Whitehill, Ivon Arroyo, Beverly Woolf, Stan Sclaroff, and Margrit Betke. "Leveraging Affect Transfer Learning for Behavior Prediction in an Intelligent Tutoring System" *New England Computer Vision Workshop (NECV)* (2019) **(Oral)** and *Under Review for Journal* (2020)

#### [Paper, ICLR 2019]

**Nataniel Ruiz**, Samuel Schuler, Manmohan Chandraker. "Learning To Simulate" *International Conference on Learning Representations (ICLR)* (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, 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, 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. "Dockeface: an Easy to Install and use Faster R-CNN Face Detector in a Docker Container." *arXiv preprint arXiv:1708.04370* (2017)

### PATENTS

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Schuler, Samuel, Nataniel Ruiz, and Manmohan Chandraker. "Learning to simulate." U.S. Patent Application No. 16/696,087.

### PRESENTATIONS

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#### *Invited Talks*

Sep 2020	University of Massachusetts at Amherst, College of Information & Computer Sciences, guest lecture
Aug 2020	Apple Inc., Senior Director of AI and Machine Learning, research presentation
Mar 2020	Boston University, Department of Computer Science, AI Research Lab, seminar
Feb 2020	Massachusetts Institute of Technology, Computer Science and AI Laboratory, Vision and Graphics Group, seminar
Nov 2019	Georgia Institute of Technology, School of Interactive Computing, seminar
Oct 2019	University of Massachusetts at Amherst, College of Information & Computer Sciences, guest lecture
Sep 2019	Apple Inc., Machine Learning Vice President, research presentation
Aug 2019	Apple Inc., Siri, research presentation
Aug 2019	Apple Inc., AI Research, research presentation
Feb 2019	Boston University, Department of Computer Science, AI Research Lab, seminar
Feb 2019	Boston University Data Science Day, distinguished presenter
Jan 2019	Boston University, AI Research Lab Retreat, invited presentation
Jan 2019	KPMG, Bolivia, machine learning seminar
Aug 2018	NEC Laboratories America Inc., research presentation

## ***Contributed Talks***

Aug 2020 ECCV, Advances in Image Manipulation Workshop, oral presentation  
Jun 2020 CVPR, Workshop on Adversarial Machine Learning in Computer Vision, oral presentation  
Dec 2019 New England Computer Vision Workshop (NECV), Brown University, oral presentation  
Sep 2019 Machine Intelligence Conference (MIC), Boston University, oral presentation  
Jun 2018 CVPR, Automatic Face and Gesture Recognition Workshop, oral presentation

## ***Posters***

Aug 2020 ECCV, Advances in Image Manipulation Workshop  
Jun 2020 CVPR, Workshop on Adversarial Machine Learning in Computer Vision  
Dec 2019 New England Computer Vision Workshop (NECV), Brown University  
May 2019 International Conference on Learning Representations (ICLR)  
Feb 2019 Boston University Data Science Day  
Jun 2018 CVPR, Automatic Face and Gesture Recognition Workshop

## **RESEARCH EXPERIENCE**

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**Apple AI Research**, Cupertino, CA Jun 2019 - Aug 2020  
*Research Assistant Intern*  
• Working with **Dr. Nick Apostoloff** and **Dr. Barry Theobald** on computer vision and machine learning.

**Apple AI Research**, Cupertino, CA May 2019 - Aug 2019  
*Research Assistant Intern*  
• Worked with **Dr. Nick Apostoloff** and **Dr. Barry Theobald** on computer vision and machine learning.

**Boston University**, Boston, MA Sep 2018 - Present  
*Research Fellow*  
• Working with **Prof. Stan Sclaroff** and **Prof. Margrit Betke** on topics related to facial analysis, image translation, adversarial attacks, simulation and behavior understanding.

**NEC Laboratories America, Inc**, Cupertino, CA Feb 2018 - Aug 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 Dec 2016 – Dec 2017  
*Graduate Research Assistant*  
• Worked with **Prof. James Rehg** on facial analysis, behavior understanding, 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.

**Massachusetts Institute of Technology**, Cambridge, MA May 2016 – Aug 2016  
*Visiting Research Assistant (funding: 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.

## REVIEWER

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Conference on Neural Information Processing Systems (NeurIPS) 2020  
Conference on Computer Vision and Pattern Recognition (CVPR) 2018  
International Conference on Computer Vision (ICCV) 2019  
Transactions on Pattern Analysis and Machine Intelligence (TPAMI) 2019-2020  
Winter Conference on Applications of Computer Vision (WACV) 2020  
Asian Conference on Computer Vision (ACCV) 2020  
Pattern Recognition 2020  
Transactions on Neural Networks and Learning Systems (TNNLS) 2018-2020  
Transactions on Cybernetics 2018

## SELECTED PROJECTS

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**1,800+ stars** on original machine learning GitHub repositories at [github.com/natanielruiz](https://github.com/natanielruiz)

[Disrupting Deepfakes: Adversarial Attacks on Conditional Image Translation Networks](#)

- Adversarial attacks on image translation systems to prevent modification of a person's images

[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.

[EGTEA Gaze+ Dataset](#)

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

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.

## PRESS

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[Learning to Simulate in Medium](#)

- 16,000+ views
- Front page on Y Combinator's [Hacker News](#)
- Front page on [Towards Data Science](#)

[Disrupting Deepfakes](#)

- [TWIML AI Podcast](#)
- Mentioned on [Forbes](#)
- Front page on Boston University's [The Brink](#)
- Front page on Y Combinator's [Hacker News](#)
- Front page on Reddit /r/machinelearning subreddit

## 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), Advanced Optimization Algorithms (CS 531)

### **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)

## RESEARCH MENTORSHIP

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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

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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)