


# Ameya Daigavane

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## Education

- Indian Institute of Technology, Guwahati** Guwahati  
*B.Tech in Computer Science and Engineering* 2016-2020
  - GPA 9.38/10, with a Minor in Mathematics (Minor GPA 10/10).

## Experience

- Pre-Doctoral Researcher - Google Research** Bangalore  
*Mentors: Dr. Gaurav Aggarwal and Dr. Prateek Jain* September 2020 - Current
  - Designing differentially-private graph neural networks.
  - Researching interactive techniques for visualizing microplate experiments.
- Research Intern - NASA, Jet Propulsion Laboratory** Pasadena  
*Mentor: Dr. Gary Doran, Machine Learning and Instrument Autonomy* June 2020 - August 2020
  - Designed, prototyped and assessed radiation sensitivity of time-series anomaly detection methods in a flight system setting.
- Research Intern - NASA, Jet Propulsion Laboratory** Pasadena  
*Mentor: Dr. Kiri Wagstaff, Machine Learning and Instrument Autonomy* May 2019 - July 2019
  - Explored unsupervised algorithms for onboard event detection in time-series data for the Plasma Instrument for Magnetic Sounding on the upcoming Europa Clipper mission.
  - Developed a novel extension of the matrix profile for the discovery of anomalous subsequences in multidimensional time-series.
- Research Intern - Indian Institute of Science** Bangalore  
*Mentor: Prof. Aditya Gopalan, Dept. of ECE* May 2018 - July 2018
  - Designed a novel storage-sensitive two-stage outlier detection system for the Environmental Control System monitoring cabin conditions on Boeing aircraft.
- Research Intern - Indian Institute of Technology, Gandhinagar** Gandhinagar  
*Mentor: Prof. Shanmuganathan Raman, Dept. of EE* May 2017 - July 2017
  - Investigated optical flow and histogram-of-motion algorithms for crowd motion anomaly analysis.
  - Developed a web interface for visualization of pedestrian traffic from different video feeds.

## Publications

- Understanding Convolutions on Graphs**  
*Ameya Daigavane, Balaraman Ravindran, Gaurav Aggarwal.*  
Published at Distill.
- Interactive Media for Understanding ML Methods: A Case-Study on Graph Neural Networks**  
*Ameya Daigavane, Balaraman Ravindran, Gaurav Aggarwal.*  
Accepted for poster presentation at Rethinking ML Papers, ICLR - 2021.
- Detection of Environment Transitions in Time Series Data for Responsive Science**  
*Ameya Daigavane, Kiri Wagstaff, Gary Doran, Corey Cochrane, Caitriona Jackman and Abigail Rymer.*  
Accepted for oral presentation (one of five papers) at MiLeTS, KDD - 2020.

- **Time-Series Analysis Methods for Onboard Detection of Magnetic Field Boundaries by Europa Clipper**  
*Ameya Daigavane, Kiri Wagstaff, Gary Doran, Corey Cochrane, Caitriona Jackman and Abigail Rymer.*  
Accepted for poster presentation at Second AI and Data Science Workshop for Earth and Space Sciences, 2020.
- **2-uniform Words: Cycle Graphs, and a Algorithm to Verify Specific Word-Representations of Graphs**  
*Ameya Daigavane, Mrityunjay Singh, and Benny K. George.*  
Accepted for presentation at Workshop on Words and Complexity, 2018.



Publications under review:

- **Unsupervised Detection of Magnetic Field Boundary Crossings From Plasma Spectrometer Data**  
*Ameya Daigavane, Kiri Wagstaff, Gary Doran, Corey Cochrane, Caitriona Jackman and Abigail Rymer.*
- **Machine Learning at Europa: How to Determine Which Algorithms Will Work Onboard a Spacecraft**  
*Gary Doran, Ameya Daigavane, Kiri Wagstaff.*
- **Deep learning and automated Cell Painting reveal Parkinsons disease-specific signatures in primary patient fibroblasts**  
*Lauren Schiff, et al.*




## Awards and Honours

ACM SIGBED Scholars Award – One of three undergraduates awarded . . . . .	2020
ACM SIGKDD Student Registration Award . . . . .	2020
Caltech Summer Undergraduate Research Fellowship (SURF) Award . . . . .	2019
ACM ICPC Qualifiers – 61 <sup>st</sup> in India among 4000+ teams – Team: Team007. . . . .	2019
ACM ICPC Kanpur Regionals – 18 <sup>th</sup> in India among 200+ teams – Team: Team007. . . . .	2019
OzCHI Student Design Challenge – Honorable Mention (Top 5) – Team: Bands of Bagels . . . . .	2019
Outstanding (AS) Grade awarded in 10 courses across CS and Math . . . . .	2016-2020
Analyze This – Outstanding Performer – 55 <sup>th</sup> in India among 2000+ teams. . . . .	2017
KVPY Science Scholarship – SA Stream – 156 <sup>th</sup> in India . . . . .	2015
FIITJEE Talent Reward Examination – 1 <sup>st</sup> in India . . . . .	2014
Regional Mathematics Olympiad – 1 <sup>st</sup> in state . . . . .	2014
National Standard Examination in Junior Science – 1 <sup>st</sup> in state . . . . .	2012
NTSE Science Scholarship – 8 <sup>th</sup> in state . . . . .	2012

## Selected Open-Source Contributions

- **fmga** Derivative-free objective function maximization with parallelized genetic algorithms  
*Original Developer* : 65+ stars
- **densratio\_py**  $\alpha$ -relative probability density ratio estimation with RuLSIF  
*Developer and Maintainer* : 70+ stars

## Selected Projects

- **Spectral Clustering in Heterogeneous Networks** 
  - Implementation of SClump, a metapath-based community detection algorithm, from the AAAI 2019 paper by Li, et al, in Python.
- **Inference over Stochastic L-Systems** 
  - Generates a tree by assigning graphical actions to a L-system, and then builds a MCMC inference model with WebPPL to estimate the depth of recursion.
  - Featured as a Community Contribution on The Coding Train's tutorial on L-Systems.
- **Time-Series Salient Subsequence Visualization** 
  - Visualization of time-series in Python with the matrix profile by salience subsequence selection, based on the ICDM 2016 paper by Yeh, et al.