

# Ameya Patil

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## EDUCATION

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- University of Washington, Seattle** WA, USA  
Ph.D. in Computer Science, Advised by **Dr. Leilani Battle** Sept 2021 - Present  
– **Research Interests:** Interactive Data Analytics for environmental sciences, Information Visualization, Computer Graphics
- University of Maryland, College Park** MD, USA  
Ph.D. in Computer Science, Advised by **Dr. Leilani Battle**, GPA: 4.00/4.00 Jan 2021 - May 2021  
– **Research Interests:** Interactive Data Analytics, Information Visualization, Computer Graphics  
– **Relevant coursework:** Game Design
- University of Maryland, College Park** MD, USA  
M.S. in Computer Science, GPA: 3.84/4.00 Aug 2018 - Dec 2020  
– **Relevant coursework:** Machine Learning, Geometric Computer Vision, Advanced Computer Graphics, Physically Based Modelling, Simulation & Animation, Interactive Data Analytics, Computational Geometry, Interactive Technologies in HCI, Database System Architecture and Implementation
- Birla Institute of Technology and Science - Pilani** Goa, India  
B.E. (Honors) in Computer Science, GPA: 8.24/10.00 Aug 2012 - May 2016  
– **Electives:** Data Mining, Data Storage Technologies and Networks, Creative Multimedia

## ONGOING RESEARCH

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- **Exploratory Visual Analysis Systems for Large Scale Graph Data** UW-UMD-MIT-Tufts  
As graphs continue to grow in scale and complexity, analysts can no longer find intuitive graph exploration and analysis interfaces that maintain interactive response times. Existing tools tend to solve a narrow slice of this problem, such as supporting only visual browsing, or only running a limited set of graph algorithms such as path-finding or attribute-based filtering. This makes it necessary for users to rely on multiple tools, and in all cases users have to know beforehand exactly how they will visualize/analyze the graph to select an appropriate approach, restricting opportunities for exploratory analysis of large graphs. To address the issue of scale and ease of graph exploration, I am working on building an integrated system for authoring scalable interactive graph visualization and analysis interfaces, called Kyrix-G. Kyrix-G employs adaptive data reduction to jointly improve graph visualization and optimize implementations of common graph analysis tasks. Kyrix-G uses graph data properties to implement DB and OLAP style optimizations to enable exploration and analysis of large graphs having several millions of nodes and edges.

## PUBLICATIONS

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1. **A. Patil**, G. Richer, C. Jermaine, D. Moritz, J.-D. Fekete, “Studying Early Decision Making for Progressive Bar Charts”, *IEEE Transactions on Visualization and Computer Graphics*, 2023
2. A. Aguinaldo, P.-Y. Chiang, A. Gain, **A. Patil**, K. Pearson and S. Feizi, “Compressing GANs using Knowledge Distillation”, *CoRR*, vol. *abs/1902.00159*, 2019. [arXiv:1902.00159](https://arxiv.org/abs/1902.00159)

## TEACHING

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- **Head Teaching Assistant** at University of Maryland, College Park  
Computer Systems Architecture (CMSC411) Fall 2018, Fall 2019, Fall 2020
- **Teaching Assistant** at University of Maryland, College Park  
Introduction to Data Visualization (CMSC498O) Spring 2019, Spring 2020
- **Teaching Assistant** at University of Maryland, College Park  
Advanced Data Structures (CMSC420) Spring 2021

## EXPERIENCE

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**AVIZ, Inria** Saclay, France  
Research Intern, advised by **Dr. Jean-Daniel Fekete** Summer 2021

- Worked on understanding the efficacy of confidence intervals for decision making using progressive bar charts
- Proposed and studied the efficacy of two new visualization designs for progressive bar charts
- Studied the performance of humans vs automated statistical test for the task of answering questions based on progressive visualizations

**Fraunhofer CESE** MD, USA  
Research Assistant Intern, advised by **Dr. Marcel Schäfer** Summer 2019

- Worked as Java developer on the [PocketSecurity](#) project which collects data to perform user behaviour analysis
- Identified and implemented critical data probes to be collected for better analysis and improved existing probes

**NVIDIA** Pune, India  
System Software Engineer - C/C++ July 2016 - July 2018

- Developer for Shadowplay - a gameplay sharing app with features like record, screenshot, broadcast and coplay
- Worked on multi-threaded and multi-processes features, GPU driver code and render pipeline
- Enhanced and monitored the automated software testing suite and guided an intern for the same

**NVIDIA** Pune, India  
Intern July 2015 - Dec 2015

- Device Filter Drivers - C/C++: Implemented end-to-end user input redirection from input devices to a specific application using filter drivers and device notifications
- Z-buffer - Python: Implemented aesthetic visual effects such as zoom burst using the depth data of images

## PROJECTS

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- **Physically Based Clustering Visualization** Oct 2019 - Dec 2019  
Implemented a data analysis/visualization tool with interactions modelled on real-life physical forces using the D3-Force API. The specific use case targeted was evaluating word embeddings created by different methods, where words closer in the vector space belonged to the same cluster.
- **Adding shadows to a scene using CNN** April 2019 - May 2019  
Trained a network to generate shadows in a scene, given the scene without shadows, the depth map and the light source position map. Used the [pix2pix](#) model for the task.
- **GoRoutines vs OpenMP** Oct 2018 - Dec 2018  
Comparatively evaluated the parallelization constructs of Go language and OpenMP using various task distribution schemes among threads. 2D image convolution operation was used for the study.
- **Data Sonification** Jan 2016 - Apr 2016  
Investigated and implemented possible correlations between digital images and digital sounds for image encoding. Characterized aural encoding channels similar to visual encoding channels.
- **LEAP Motion App Development** Mar 2015 - Apr 2015  
Programmed the LEAP Motion sensor to create a hand gesture based virtual music instrument dashboard. Used JAVA Swing for the UI and MIDI files for the audio.

## SKILLS

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- **Programming Languages:** C, C++, Java, Python
- **Libraries/Frameworks:** Pytorch, OpenCV, MPI, OpenMP
- **Miscellaneous:** DSLR Photography, Adobe Lightroom

## LANGUAGES

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- **Marathi:** Native
- **Hindi:** Fluent
- **English:** Fluent

## EXTRACURRICULAR ACTIVITIES

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- **University of Washington, Seattle K-12** 2022  
Participated in the UW, Seattle K-12 outreach program by presenting my research work to high school students
- **Volunteer at Ekta Nagar Residents Welfare Association** 2017 - 2018  
Aided in the organisation of community activities and administrative affairs of my residential society
- **Organising Committee Member at Quark (BITS - Pilani Goa Technical Festival)** 2015  
Directed the photo and video coverage of the technical festival spanned over 3 days
- **Member at The Department of Photography, BITS-Pilani Goa** 2012 - 2015  
Performed photo and video coverage of campus events over 3 years and mentored new inductees