Sindhu Yepuri

Turing Scholar, CS Honors, Math Major, Junior

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EDUCATION

The University of Texas at Austin - B.S. in Computer Science Turing Scholars and Mathematics

Expected Graduation: May 2024

- Honors Operating Systems
- Honors Computer Graphics
- Classical Dynamics
- Honors Computer Architecture
- *Honors Programming Languages*
- Honors Intro to CS Research
- Linear Algebra
- Honors Data Structures
- Natural Language Processing
- *Computer Networks*
- Honors Discrete Math
- Intro to Statistics/Probability
- Differential Equations
- Intro to Algebraic Structures
- *Decision Analytics*

Certificates

- Neural Networks and Deep Learning — *deeplearning.ai* (2019)
- Algorithms Specialization — *Stanford Online* (2017)

SKILLS

Proficient with: C++, C, TypeScript, Python, Java, SystemVerilog

Familiar with: x86 Assembly, ISPC, CMake, SQL, HTML, JS

AWARDS & ACHIEVEMENTS

- ***2022*** | College of Natural Sciences 2022 Second Year Excellence Award
- ***2020*** | 1st Place Winner @ HackTX, Google Cloud Platform Second Place, Google COVID-19 Fund Nominee
- ***2020*** | Jerri-Ann Meyer Endowed Turing Scholarship

EXPERIENCE

Microsoft – Silicon Engineering Intern; Raleigh, NC **Jun. 2022— Aug. 2022**

Performed functional and formal verification for Microsoft Cloud's Custom CPU with a focus on its debug subsystem

- Developed re-usable *SystemVerilog* UVM functional test bench of the debug subsystem module based on micro-architectural specs.
- Implemented formal verification test bench of performance monitor through the use of cover properties, constraints, and assertions.
- Collaborated with logic designers, micro-architects and other verification engineers to develop test plan.

Texas Advanced Computing Center – Research Assistant; Austin, TX **Jun. 2021 — May 2022**

Research in advanced visualization techniques, specifically ray tracing in a high performance computing environment.

- Supervised by Dr. Paul Navrátil, Director of Visualization at TACC
- Implementing Polynomial Lens Model on Intel's OSPRay Ray Tracer at Texas Advanced Computing Center
- Enables complex lens modeling and simulation of realistic lens effects during render, including lens flare, chromatic shift, and image distortion in *C++/ISPC*.
- Simulates complex optical systems for usage such as digital optics experiments and product prototyping.
- Combines existing open-source projects, utilizes dynamic library module integration, and the *CMake* modular build system.

Computer Graphics Directed Reading Group Leader; Austin, TX **Sep. 2021 — Present**

Introducing other CS students to basic concepts such as rasterization, shading, ray tracing through the lens of related research papers

- Objective is to have members implement a ray tracer at the end of the session

The University of Texas at Austin – Undergraduate TA; Austin, TX **Jun. 2021 — Aug. 2021**

Undergraduate Teaching Assistant for Elements of Computers and Programming (CS303e) taught by Professor Mike Scott.

PROJECTS

Realistic Procedural Terrain Generation **May. 2022**

Implemented an interactive, animated scene that utilizes infinite procedural terrain and cloud generation in *TypeScript*.

- Layered octaves of Perlin noise to get more realistic terrains, utilizing band pass filtering to generate different terrain texture.
- Used smooth step function to add atmospheric coloring and grass/rock/snow to our scene.
- Added shadows to scene by tracing the light's path to check if it was obstructed (similar to ray tracing), then scaled shadow coloring for more depth.

Q&A Recurrent Neural Networks with Attention **Apr. 2022**

Trained a machine reading comprehension model, experimenting with SQuAD (Stanford Q&A Dataset).

- Implemented baseline continuous bag of words model & improved with a Gated Recurrent Unit variant of RNN with gating using *PyTorch*
- Augmented RNN model with attention, used learned weights to emphasize certain context words.
- Monitored training using *TensorBoard* and compared loss, accuracies, F1, and EM across these different techniques.

qiuzOS - Doom **Feb. 2021**

Graphics coordinator for large group project that built up operating system capable of running the video game, Doom.

- Over course of semester, implemented an operating system from scratch, building up features such as preemptive multithreading, a filesystem, virtual memory management, and system calls in *C++/C*.
- Focused on extending our operating system to handle the graphics component required by Doom: X11, VGA Driver, Desktop
- Organized tasks and meetings within graphics team and corresponded with other teams working on other components of the OS

PoliTX @ HackTX 2020 Winner **Oct. 2020**

Developed a web application that connects users to local/state/national politicians and corresponding legislation using *React*.

- Uses natural language processing to categorize bills and other political statements through Google Cloud services..
- Analyzes trends of bills endorsed by politicians and provides voters with candidate history.