RYAN HARDESTY LEWIS

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EDUCATION

The University of Texas at Austin, Austin, TX — August 2021 - May 2023
Bachelor of Science in Mathematics, Certificate Elements of Computing, Certificate Computational Science and Engineering
Cumulative GPA: 4.0

Relevant Coursework: Multivariable Calculus, Linear Algebra, Modern Geometry, Probability and Statistics, Software Design, Game Development, Mobile Computing, Numerical Methods, Databases

WORK EXPERIENCE

Good Systems, University of Texas at Austin — May 2022 - Present
Undergraduate Research Assistant
- Developed and integrated machine-learning algorithms to predict future development of Austin
- Implemented gaussian smoke dispersion models for real-time fire tracking map

Department of Computer Science, University of Texas at Austin — June 2022 - July 2022
Summer Academy Program Assistant
- Helped teach over 50 students in using Java and Processing to create deployable applications
- Assisted students in low-level animation, GUI development, and data visualization

iD Tech, Remote — April 2022 - August 2022
Private Instructor
- Prepared and taught curriculum on programming and mathematics to kids 10-17 years old
- Taught over ten programming languages, as well as software tools like Blender and Unity

RESEARCH PROJECTS

Active Fire Incidents Map — July 2022 - Present
Developer: A 2D and 3D live fire map of national cities, advised by Dr. Junfeng Jiao
- Worked with the City of Austin and the Austin Fire Department underneath a $150,000 grant for the website
- Created a standardized format and Python query system for over 20 fire departments.
- Implemented Leaflet and Mapbox JavaScript libraries to geolocate and display data for over 17,000 fires.
- Predicted and displayed potential smoke paths of all fires, mapping active fire risk regions for all cities involved using GeoPandas, Plotly, and various open city data
- Generated potential smoke paths using real 3D housing geometry and fluid simulations utilizing real-time weather data with Blender scripting

Warehouse Transportation — June 2021 - Present
Developer: A logistics and transportation website, advised by Dr. Junfeng Jiao
- Backended a Python API to handle various route, vehicle configurations, and optimize distances and throughputs for the visual delivery system
- Built on top of existing C routing engine OSRM, implementing a more customized UI, scalable tables, and predictions using Toast.js

Ethical Games in Machine Learning — January 2022 - July 2022
Developer: A research project into ethical game-oriented AI, advised by Dr. Sam Baker
- Researched how situations can be gamified for machines to interpret, specifically Google's Mu-Zero, culminating in a fifteen-page paper.
- Developed an "ethical machine-learning" algorithm based on Mu-Zero, which employed different ethical strategies when playing Chess. Argued that this strategic manipulation can be used to create moral agents

PERSONAL PROJECTS

Atmosphere Cloud (Solo) July 2022 - Present

Developer: A marketplace for computer sharing.

- Created a live marketplace with Ruby On Rails for people to share idle computer resources into streaming VMs as an alternative to mining
- Combined passthrough techniques for virtualizing the GPU into a full-fledged cloud machine
- Wrote custom hypervisor to handle spawning new Windows VMs for clients using QEMU
- Worked on top of popular streaming models, including Rainway, Parsec, and Moonlight

Otaku Puzzle (Solo) July 2021 - August 2021

Developer: A 3D top-down multiplayer and solo puzzle game.

- Created a web scraper to grab images, videos, and videos from the web, and an Auto-Update executable and launcher in Visual Studio, published Standalone, to Steam and Google Play
- Implemented WebSocket multiplayer and collision-pairing of pieces using Unity and C#
- Worked with multiple libraries for GIF processing, YouTube video support, Discord integration, Steam Achievements, and Google Play Games
- Produced custom Blender models, Photoshop UI, animations, and assets

Various Websites (Solo & Team) June 2019 - Present

Developer: Websites for most of my games, people, and more.

- Produced ultra-optimized websites using CDNs, scoring 100 on Google Lighthouse
- Limited host bandwidth to <10kb per website load, backended SQL, PHP, and Heroku

Various 2D Games (Solo & Team) June 2020 - Present

Developer: Good Guy Knight, Princess & Protector, Time Trodden, etc.

- Integrated scaling systems, such as procedural difficulty, leveling, and in-game shops
- Made using GML, JavaScript, Node.JS, Phaser 3, Socket.IO, & HTML

Central Documentation (Team) April 2022

Developer: A decentralized documentation app for Android.

- Interfaced with Github API to create peer-editable and accessible code documentation
- Fully developed within Android Studio, using XML and Kotlin, published to Google Play
- Stopped development due to Github's release of "Github Repository Docs", which is the same idea, using exactly the same Github backend and frontend of Markdown files

ACTIVITIES & LEADERSHIP

Electronic Game Developers Society, Austin, TX January 2022 - Present

Unity Workshops Officer

- Taught bi-monthly seminars on using Unity and C# for game development, covering concepts ranging from basic editor manipulation to the use of quaternions in 3D space and computational physics in game engines
- Helped host the largest student-run game jam in Texas in 2022, with over 200 participants from more than 10 colleges

Student World Affairs Council, Houston, TX August 2016 - February 2021

Student Ambassador

- Listened to, questioned, and took notes on monthly internationally-renowned speakers

SKILLS

Programming Languages: C#, Python, Java, HTML, CSS, JavaScript, C++, SQL, Kotlin, GML, XML, Bash
Tools: Unity, Photoshop, Blender, Visual Studio, Unreal Engine, Android Studio, Docker, Heroku, Firebase, Linux, Git, Ruby on Rails, PyTorch
Languages: English, Spanish

AWARDS

Eagle Scout, Dean's List *x2*, Magna Cum Laude (High School), National Merit Scholar, AP Scholar with Distinction, Good Systems Undergraduate AI and Society Writing Fellowship, Dell Scholar

PUBLICATIONS

Hardesty Lewis R., J. Jiao, D. Niyogi, A. Farahi, P. Navratil, K. Seong
"Towards Smart Cities: A digital twin implementation of real-time fire and smoke tracking in a 3D city". *In Review.* KDD. Conference Paper.

K. Seong, J. Jiao, *R. Hardesty Lewis*, D. Niyogi, A. Farahi, P. Navratil
"Towards a Digital Twin for Smart Resilient Cities: Real-time fire and smoke tracking platform for community awareness". *In Review.*
Journal of Urban Technology. Journal Paper.

OTHER LINKS

Google Scholar: https://scholar.google.com/citations?user=c1KcQKQAAAAJ
ResearchGate: https://www.researchgate.net/profile/Ryan-Hardesty-Lewis
Github: https://github.com/ryanhlewis
Gitlab: https://gitlab.com/ryanhlewis
Personal: https://ryanhardestylewis.com

REFERENCES

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