AUSTIN HALE

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EDUCATION

UNIVERSITY OF NORTH CAROLINA – CHAPEL HILL
Computer Science, B.S.
GPA: 3.79
Graduated with Distinction
May 2021

Computer Science, M.S.
Expected May 2022

TECHNICAL SKILLS

LANGUAGES
ASM • Blueprint • C • C++ • C# • CSS • HTML • Java • JavaScript • JSL • Perl • Python • Rust • SystemVerilog • TypeScript

COMPUTER GRAPHICS
Azure Kinect • Blender • HoloLens 2 • Intel RealSense • Leap Motion • Oculus Quest • OpenCV • OpenXR • Three.js • Unity Engine • Unreal Engine

DEVELOPMENT TOOLS
Adobe • Bash • Clang-Tidy • Doxygen • Git • JIRA • Node.js • Perforce • VMware • WSL2

OPERATING SYSTEMS
Windows • macOS • UNIX • Linux

COURSES

Computer Organization
Data Structures
Discrete Structures
Algorithms & Analysis
Effective Peer Teaching in Computer Science
Foundations of Programming
Models of Languages & Computation
Little Languages
Modern Web Programming (Study Abroad in Copenhagen)
Introduction to Machine Learning
Intro to VR, Game Development and Human-Computer Interaction
2D Computer Graphics
Digital Logic and Computer Design
Files and Databases
Game Design
Software Engineering Lab
Programming Language Concepts

LINKS

Personal: austinbhale.com
Github:// austinbhale
LinkedIn:// austinbhale

EXPERIENCE

UNC – Chapel Hill | Undergraduate Research Assistant | January 2019 - Present
Graphics and Virtual Reality Group
- Collaborate with surgeons from the UNC School of Medicine on the development of an AR educational tool using Microsoft's HoloLens 2 in Unreal Engine.

Enabling Technologies
- Developed two web applications (Tar Heel Music and Tar Heel Hero) designed to help people with disabilities participate in education, literacy, and gameplay.

UNC – Chapel Hill | Undergraduate Teaching Assistant | August 2018 – May 2021
Models of Languages and Computation
- Apply formal language concepts to students through online communication and feedback.

Effective Peer Teaching in Computer Science
- Strengthened current and future learning assistants' understanding of topics in computer science pedagogy by creating twenty scenario-based videos.

Foundations of Programming
- Reinforced the concepts taught in the Foundations of Programming course to over 450 students through office hours, online questioning boards, and recitations.

SAS | JMP Technical Intern (Year-Round) | June 2019 – April 2021
- Write and debug Python, Perl, JSL, and C++ source code for JMP Research & Development that support the Crash Report and Documentation teams.
- Resolve defects for scripts that generate screenshot comparisons, tokenize and parse C++ source files, and triage new crashes in JMP software.

Ribbon Communications | C20 Engineering Intern | June 2018 – December 2018
- Improved the design and documentation of call server products and solutions.
- Debugged hundreds of C++ source files for programming errors using Clang-Tidy.

PROJECTS

Surgical Knot & ASL Augmented Reality Educational Tool
- Crafted an educational HoloLens 2 application with an emphasis on following the teacher tie a reconstructed surgical knot through hand tracking and 3D point clouds.
- Implemented point cloud video sequences and marker tracking (ArUco & QR Code) with multiple RealSense D435 depth cameras through RealSense and OpenCV software.
- Submitted a video demo showcasing the student-teacher process to SAGES 2021.

Analyzing Immersion in a One-vs-One Virtual Reality Game
- Implemented Remote Procedure Calls and a Steam Multiplayer system in Unreal Engine.
- Conducted a small study on immersiveness by using a steer-to-center redirection algorithm.

2D Graphics Engine
- Fostered an efficient 2D graphics engine from scratch in C++.
- Extended the engine with textures, matrix transformations, clipping, and gradients.

Game Development in Unreal & Unity Engines
- Spearheaded the Blueprint/C++ development, UI design, and story writing on two teams of 5-10 people for game jam submissions.
- Completed an audio-reactive experience with 3D mathematical algorithms, featuring a noise flow field, circle tangents, and beat detection.

Tar Heel Hero
- Developed a 3-D rhythm-based computer game rendered in Three.js.
- Introduced audio-assisted and touch-enabled features for the visually impaired.

Tar Heel Music
- Expanded on external machine learning and note sequencing libraries (e.g., Magenta.js) to create an accessible music experience for blind users.

Clang-Tidy Visualizer
- Generated a structured view of various bugs in C/C++ source code.

ACTIVITIES & LEADERSHIP

Enabling Technology Club | President | August 2017 – May 2021
- Contributed to the collection of over 10 million books read on Tar Heel Reader.
- Led over 40 members to create accessible games with Tar Heel Gameplay and websites.

Buckley Public Service Scholars | August 2017 – May 2021
- Demonstrated a strong commitment to public service. Invested 300 hours of service and four skills trainings involving effective communication practices and service abroad.

Hobbies & Other Interests
- Hackathons (HackDuke, HackNC), game jams, 3D animation, audio visualizations.