Ryan Lee

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Education

Carnegie Mellon University Aug 2024 – Expected May 2027
Bachelor of Science in Computer Science, Minor in Game Design *Pittsburgh, PA*

Experience

Software Developer Intern June 2026 – Aug 2026
General Atomics *Poway, CA*

- Collaborated on a 10-member software engineering team to develop and integrate large-scale projects, coordinating responsibilities across technical specialties through frequent stand-ups and progress reviews
- Enhanced C++ software adapters that translate proprietary hardware protocols into a standardized messaging interface by implementing new communication capabilities and expanding supported message types
- Implemented beacon lock functionality in a Combat Search and Rescue software simulator by extending simulator logic and configuration, enabling operators to lock onto a specific emergency beacon
- Enhanced the GitLab CI/CD pipeline by containerizing build tooling with Docker and automating CycloneDX SBOM generation using Syft to improve software supply-chain compliance

Machine Learning Research Assistant Apr 2025 – Sep 2025
Xu Labs, CMU *Pittsburgh, PA*

- Investigated and adapted zero-shot medical image segmentation models to generalize across diverse imaging modalities without dataset-specific training
- Built modular Python benchmarking pipelines to evaluate segmentation models across 10+ datasets, automating inference, metric computation, and result aggregation
- Optimized inference performance through batching strategies and GPU memory optimizations, significantly reducing runtime and improving throughput on large-scale datasets

Leadership

Treasurer Nov 2025 – Present
CMU Asian Student Association *Pittsburgh, PA*

- Managed and allocated a $30,000 annual budget for a student organization serving 600+ members
- Led a 15+ member finance committee to plan and execute biweekly fundraisers, overseeing financial logistics
- Collaborated with the executive board to coordinate large-scale events for 200+ attendees while maintaining budget constraints and communicating with external vendors and partners

Orientation Leader Apr 2026 – Aug 2026
Carnegie Mellon University *Pittsburgh, PA*

- Planned and executed large-scale Orientation events for 1,500+ first-year students
- Led and mentored a team of 30 Orientation Counselors supporting first-year students in one of Carnegie Mellon's largest residence halls, serving as their primary point of contact throughout Orientation
- Collaborated with fellow Orientation Leaders to oversee campus-wide programming and provide logistical support

Projects

MoleculeXR | *C#, Unity3D, Blender* Jan 2026 – May 2026

- Developed a VR DNA editor and simulator in Unity for the Meta Quest, enabling interactive construction, editing, visualization, and experimentation with DNA structures in real-time
- Designed an extensible DNA architecture using linked lists to support efficient insertion, deletion, and manipulation of nucleotides while enabling configurable structural properties including twisting and stretching
- Implemented interactive VR editing tools including splicing, unzipping, stretching and compression, painting, and persistent save and load functionality

Scotty3D | *C++* Aug 2025 – Dec 2025

- Implemented a triangle rasterization pipeline, including mesh transformations, perspective projection, clipping, depth testing, and line rasterization using the diamond exit rule
- Built a Monte Carlo path tracer supporting Lambertian, dielectric, and emissive materials using recursive backward ray tracing and importance sampling, enabling physically based lighting and global illumination effects
- Developed a skeletal animation and inverse kinematics system using bone hierarchies, forward kinematics, and gradient-based optimization to support target-driven pose adjustments and smooth character motion

AutoMiSeg | *Python, PyTorch, NumPy, OpenCV, scikit-learn, Matplotlib* Apr 2025 – Sep 2025

- Improved a zero-shot medical image segmentation system using PyTorch by extending preprocessing, inference, and evaluation pipelines to support scalable benchmarking and iterative model refinement
- Optimized bounding box generation logic and tuned model hyperparameters to improve segmentation robustness
- Evaluated the system across multiple medical image datasets (e.g., MedSegBench), iteratively improving Dice, Normalized Surface Dice, and IoU metrics

Malloc Lab | *C, Git* Jul 2025

- Developed a dynamic memory allocator in C supporting malloc, free, and realloc
- Optimized allocator to achieve 73.3% memory utilization and 12,457 Kops/s throughput
- Implemented best-fit search, segregated free lists, and miniblock optimization strategies

Thumbs Up | *C#, Unity3D, Blender* Aug 2024 – Jan 2025

- Developed a 3D fighting game in Unity as part of an 8-person team, featuring real-time input, animation, custom music and arenas, and smooth physics-based combat between thumb characters
- Implemented frame buffering and dynamic hitbox systems to support responsive controls and smooth gameplay
- Won CMU Game Creation Society Gold Award (Fall 2024), recognizing the project as the top student-made game of the semester among 10+ submissions

Technical Skills

Languages: C++, C, Java, Python, C#, JavaScript, SML, LaTeX
Developer Tools: Git, GitLab, Linux, Docker, Gradle, Unity3D, VS Code, Grafana, Prometheus, Blender
Libraries: PyTorch, pandas, NumPy, OpenCV, scikit-learn, Matplotlib, Hugging Face