Caroline **LACHANSKI**

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EXPERIENCE

Pixar Animation Studios, Emeryville, CA   *Feb 2020 - Present*
Software Engineering Resident, GPU Team, under Pol Jeremias-Vila (Lead Graphics Software Engineer)
- Prepared and implemented changes to UsdPreviewSurface spec, including features such as normal mapping, texture colorspace specification, texture transformations, opacity thresholding, and more
- Debugged visual errors in in-house rasterizing renderer for internal and external users of USD and usdview
- Engineered other improvements to rasterizing renderer including handling of pre-multiplied alpha and refactoring of fragment shader discards

Activision, Central Technology, Portland, ME   *May 2019 - Aug 2019*
Programming Intern, under Michael Vance (Technology Fellow)
- Helped integrate new subdivision surfaces system using adaptive quadtrees into *Call of Duty* renderer
- Ported tool for collecting shader performance statistics between different game engines
- Used GPU debugging/profiling tools to analyze engine and shader code and look for points of optimization

University of Pennsylvania Price Lab for Digital Humanities, Philadelphia, PA   *Sept 2018 - May 2019*
3D Programming Intern
- Developed interactive VR/AR experiences for Oculus Rift, HoloLens, Android, and iOS for visualizing archaeological artifacts and locations using Unity, C#, and Vuforia
- Wrote step-by-step guides and helped run workshops on Unity and VR/AR for Penn community

STRIVR, Menlo Park, CA   *May 2018 - Aug 2018*
Software Engineering Intern, under Rama Pagadala (Director of Engineering)
- Developed workplace communications training application for Oculus Rift and Go using Unity and C#
- Designed and documented new workflow for storing and accessing project assets with asset bundles
- Implemented 3 new shaders, improved UI/UX, and added new features such as a spherical video scene

EDUCATION

University of Pennsylvania School of Engineering and Applied Science   Philadelphia, PA
   MSE in Computer Graphics and Game Technology, **GPA:** 3.94/4.00   *Dec 2019*
   BSE in Digital Media Design, **GPA:** 3.76/4.00, **Minors** in Fine Arts, Mathematics   *May 2019*
Coursework: GPU Programming and Architecture**,** Physically-Based Animation**,** Interactive Computer Graphics, Computer Graphics Rendering, Computer Animation, Procedural Graphics, Game Design and Development, Data Structures and Algorithms, Linear Algebra, 3D Modeling

SKILLS

Languages: C++, GLSL/HLSL, C#, Java, Python, MEL, CUDA, TypeScript, C
Software/Tools/API: Unity, OpenGL, WebGL, Vulkan, Git, Perforce, Visual Studio, Qt, Blender, Photoshop, Illustrator

PROJECTS

Realtime Hair Sim: *C++, Vulkan, GLSL*   *Fall 2019*
- Group project implementing a real-time, physically-based hair simulation and renderer. Responsible for hair rendering using Marschner Model approximations, hair strand tessellation, geometry shader expansion, shadow mapping with percentage closer filtering, and more.

GPU Path Tracer: *CUDA, C++*   *Fall 2019*
- GPU-parallelized Monte Carlo path tracer featuring ray termination via stream compaction, anti-aliasing, glTF mesh loading with bounding box, thin lens camera, various bokeh shapes, and first bounce caching

Maya Plugins: *C++, Python, MEL, Maya API*   *Spring 2019*
- Developed custom Maya plugins, including a deformer node based on *Dijkstra-based Terrain Generation Using Advanced Weight Functions*, an L-system node, and a random points node, featuring MEL-based menus

Procedural Graphics Projects: *TypeScript, WebGL*   *Spring 2018*
- Developed interactive, procedural projects, including an art-directable cactus l-system, a planet scene using 3D FBM, Perlin noise, and Worley noise, and a real-time sphere-traced scene using implicit surfaces