Josh Carstens

Post & Virtual Production Person

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EDUCATION

Rochester Institute of Technology, Rochester NY — *Motion Picture Science, BS*

AUGUST 2018 - MAY 2022

GPA: 3.6 / 4.0

Motion picture science is a unique interdisciplinary major which prepares students for work in the field of digital cinema and image capture, either in research engineering roles or in technical post-production positions.

EXPERIENCE

DNEG, Montreal QC — *Assistant Pipeline TD*

SEPTEMBER 2022 - PRESENT

Developing and improving internal technologies used by artists as well as providing direct technical advice and support to artists; monitoring render farm usage; providing testing and feedback for software written by the R&D team.

MAGIC Spell Studios, Rochester NY — *Digital Project Designer*

JANUARY 2022 - MAY 2022

Developed a recommendation for MAGIC's use of motion capture systems in the present and future. Evaluated several industry-standard camera and performance tracking solutions.

Production Resource Group, Secaucus NJ — *Camera Intern*

JULY 2021 - AUGUST 2021

Developed lighting products with PRG's in-house R&D department; learned quality control procedure for LED, audio, and camera equipment. Conducting a senior project that contributes to a patent for PRG involving using primaries other than RGB in LED products to improve sensor metamerism.

American High, Syracuse NY — *Previs Engineer*

FEBRUARY 2021 - DECEMBER 2021

Preparation of camera choreography and techviz in an experimental virtual production workflow in Unreal through RIT's Magic Spell Studios. Managing digital recreation of facilities using LiDAR scanning.

Center for Imaging Science at RIT, Rochester NY — *Research Assistant*

SEPTEMBER 2020 - APRIL 2021

Formatting and analysis of radiometric data from wildfire experiments with Dr. Robert Kremens; UAS hyperspectral reflectance conversions with Dr. Charles Bachmann; writing tools for dead pixel masking with Dr. Aaron Gerace.

SKILLS

Media production - familiar with NLEs such as Premiere Pro and Davinci Resolve; VFX suites like After Effects and Nuke; and DAWs like Pro Tools, Ableton, and countless industry-standard audio plugins. Operational experience with all types of cinema hardware, from the Arri Alexa and Sony Venice to LED walls and video processors.

Color science - familiar with the evolving exhibition standards, image quality evaluations, and emerging techniques of the application of color science in a cinema context, including newer pipelines like ACES and legacy workflows like Cineon.

Programming - familiar with C++, Python, MATLAB, batch scripting, some PureData and Perl. Also familiar with database management tools like MySQL.

Virtual production - familiar with the ins and outs of virtual production-related hardware and software, from configuring actor and camera mocap with Vive trackers and Optitrack to working with large-scale video walls through Unreal's nDisplay.

3D capture - familiar with the fundamentals of LiDAR, photogrammetry, and operation of software packages like Agisoft Metashape and CloudCompare.

PROJECTS

Reverie, music video

Directed a music video for a song from my album *ALMOST* utilizing several virtual production techniques. Communicated with a virtual art department, worked to implement Vive-based camera tracking through Unreal's nDisplay to a 10m×5m video wall. Further utilized Unreal to create plates to composite mocap-driven virtual characters on top of raw footage in post. Video named as Honorable Mention in RIT's School of Film & Animation 2022 Honors Show.

Cinema Camera Shootout, technical paper and video

With a team of two other Motion Picture Science students, quantitatively tested and compared two cinema cameras - RED's DSMC2 with a HELIUM 8K sensor and Blackmagic Design's Ursa Mini Pro G2 4.6K - across several categories, including image sharpness, noise, color reproduction, and ease of compositing.

Image processing programs, C++ repository

A set of OpenCV-based imaging science applications and implementations written in C++ using Eigen3 and Boost libraries. Includes implementations of several concepts and algorithms such as Harris and FAST feature detection, motion amplification, DFT/FFT, and debayering. (GitHub available on my website)

Small object 3D imaging array, Freshman Imaging Project

Worked alongside other students to design an imaging system from scratch used to assist the Seneca Park Zoo with automatically capturing 3D models of unknown species of insects from Madagascar. Made crucial decisions involving the camera modules and lenses used on the final array, as well as writing the script to run the image output through modeling software. Presented at Imagine RIT 2019.

Systems engineering - familiar with the process of planning and execution of long-term system design projects, specifically in the context of imaging.

Data science - familiar with imaging and statistics-related Python packages like NumPy, SciPy, pandas, and OpenCV. Also used to working with Jupyter notebooks.

Web development - familiar with HTML and CSS, front-end frameworks like Bootstrap, and DNS configuration. Loosely familiar with JavaScript, PHP, and Apache.