Brad Guesman

CREATIVE TECHNOLOGIST

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Education

Brown University **Providence, RI., Aug 2016-Jun 2020.**

- **Degrees.** A.B. Computer Science, A.B. Physics. Cumulative GPA: 4.0/4.0.
- **Relevant Coursework.** Advanced Computer Graphics, Deep Learning, Computer Vision for Graphics and Interaction, Design and Analysis of Algorithms, Computer Systems, Honors Linear Algebra, Abstract Algebra, Statistical Mechanics, General Relativity.

Experience

Expanse Volumetrics, Creator **San Francisco, CA. Jun 2020-Present.**

- **Architected a state-of-the art volumetric sky, clouds, and atmosphere system for Unity's High Definition Render Pipeline.**
- Blends current research with original physically-based strategies to achieve stunning, art-directable results at real-time performance.
- Developed marketing mix, including website, in-depth tutorials and documentation, and all other promotional materials.
- Nominated for best creative tool in 2021 Unity awards, ranked #1 new asset by CodeMonkey YouTube channel (200k subscribers).
- Over 1200 copies sold to date. https://www.expanseskies.com/

NVIDIA, Software Engineer, Simulation Tech **Remote, Sept 2020-Present.**

- **Engineer on NVIDIA's DRIVESim, a real-time simulation of hyper-realistic virtual environments for autonomous vehicle stacks.**
- Primary architect of procedural traffic model, built to convincingly simulate driver behavior in an authorable and scalable fashion.
- Collaborates with a multi-disciplinary team of over 60 engineers, 3D artists, and product managers.
- Recipient of the "Top Contributor A" award, given to the top performing 10% of employees across the entire company.

Brown Visual Computing, Researcher **Providence, RI. Jan 2019-June 2020.**

- **Published a novel system for geometry and SVBRDF estimation via differentiable path tracing in the 3DV Conference.** Paper link.
- Researched procedural content generation at the intersection of computer graphics and machine learning.
- Worked with two masters students, advised by two professors (James Tompkin and Daniel Ritchie).

Raven Software, Activision, Audio and Graphics Software Development Intern **Madison, WI. Jun-Aug 2019.**

- **Reworked core features of the COD: Modern Warfare engine, at the intersection of geometry processing and sound transport.**
- Collaborated with a cross-disciplinary team of artists, engineers, and designers.
- Created an original algorithm to solve a problem in an active area of sound research, within strict AAA performance requirements.

Brown STEAM (STEM + Art), Co-President ('18/19) and Member ('17-20). **Providence, RI. Jan 2017-Jun 2020.**

- Led students and faculty to plan/execute/promote multimedia projects and experiential workshops on interdisciplinary thinking.
- Organized weekly club meetings, monthly one-on-one check-ins, and frequent syncups with different subteams.

Brown CS Department, TA: Computer Graphics ('19) and Intro to CS ('17) **Providence, RI. Sept-Dec 2017, Jun 2019-Dec 2019.**

- Graphics: Helped students master key CG concepts including lighting, viewing, and image processing. Professor: Andy Van Dam.
- Intro to CS: Educated students on algorithms, analysis, and data structures in Racket and OCaml. Professor: John "Spike" Hughes.

SN0WCRASH, Independent Artist **Los Altos, CA and Providence, RI. Jan 2016-Present.**

- Wrote, engineered, recorded and produced three EPs and one record, released on self-founded indie label.
- One million plays and counting on Soundcloud, Spotify, and Apple Music.

Projects

Projects and portfolio work are an important part of a creative resume. **Visit my website, bradguesman.com, for more info.**

- **Virtual Sky:** Offline physically-based simulation of cumuliform clouds using computational fluid dynamics.
- **Digital Arboretum:** Procedural generation of tree geometry, using stochastic Lindenmayer systems.
- **Black Hole Ray Tracing:** A classic computer graphics algorithm, reimagined in curved spacetime.
- **The Replicant Delay:** Stereo analog delay simulation for digital audio workstations.

Skills and Interests

Programming Languages	C, C++, GLSL, HLSL, C#, Golang, Java, Python, Scala, OCaml, HTML/CSS, JavaScript.
Technologies	OpenGL, Vulkan, NVIDIA Falcor, DX12/DXR, USD, Unity HDRP, Tensorflow, Pytorch, .NET, Git, SVN, Perforce, Eigen, MongoDB, VST2/3, AU, PS4 Dev Tools, Google Cloud, Qt, d3.js, p5.js, Redner.
Computer Programs	Unity, Blender, Logic Pro X, Photoshop, Max/MSP, Premiere Pro, JIRA, Gitlab.
Things I Like That Aren't Work	Running, Cooking, Playing With Vintage Guitar Effects, Sci-Fi, Coffee Snobbery.