Brad Guesman Graphics. Physics. Music. Code.

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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, Computer Systems, Deep Learning, Computer Vision for Graphics and Interaction, Design and Analysis of Algorithms, Honors Linear Algebra, Abstract Algebra, Statistical Mechanics, General Relativity.

Tech and Engineering Experience

NVIDIA, Software Engineer, Simulation Tech   **Santa Clara, CA. Sept 2020-Present.**
- Engineer on NVIDIA's DriveSim product, a tool to procedurally model virtual environments for testing autonomous vehicle stacks.
- Straddles the boundary between many different system components, including rendering tech, content generation, and runtime.
- Collaborates with a multi-disciplinary team of over 60 engineers, 3D artists, and product managers.

Brown Visual Computing, Researcher   **Providence, RI. Jan 2019-June 2020.**
- Researched procedural content generation at the intersection of computer graphics and machine learning.
- Developed a novel system for geometry and SVBRDF estimation via differentiable path tracing.
- 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 transport research, within the strict performance requirements of a AAA first-person shooter.
- Reported to the director of engineering for the entire studio.

Spansive, Software/Firmware Engineering Intern   **San Bruno, CA. Jun-Aug 2018.**
- Architected connectivity stack for the Spansive Source wireless charger.
- Constructed backend pub/sub service to receive telemetry data and push updates using Google Cloud IoT core.
- Developed virtual WiFi debug console for the charger using node.js.

Art and Design Experience

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.

SN0WCRASH, Independent Artist   **Los Altos, CA and Providence, RI. Jan 2016-Present.**
- Wrote, engineered, recorded and produced three EPs, released on self-founded indie label.
- Developed all aspects of marketing mix: album art and branding strategy, website, distribution plan, and promotional campaigns.
- 800,000 plays and counting on Soundcloud, Spotify, and Apple Music. www.snowcrashmusic.com

Teaching Experience

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.

Projects

Projects and portfolio work are an important part of any creative professional's resume. Here's a sampling of some things I've worked on. Visit my website, bguesman.github.io, for detailed info on all of my portfolio work.
- **Expanse.** Realtime, procedural, physically-based volumetric skies in Unity.
- **Virtual Sky.** Offline physically-based simulation of cumuliform clouds using computational fluid dynamics.
- **Digital Arboretum.** Procedural generation of tree geometry, using stochastic Lindenmayer systems. Link to video.
- **Black Hole Ray Tracing.** A classic computer graphics algorithm, reimagined in curved spacetime.
- **The Replicant Delay.** Stereo analogue delay simulation, in the AU, VST2/3, and AAX plugin formats.

Skills and Interests

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