Ryan Burgert

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Education

- **Stony Brook University: PhD Candidate of Computer Science**
  Research Areas: Diffusion Models, Computer Vision, Sim-To-Real, Robotics *Aug 2020 - Present*
  Relevant Courses: *Computational Geometry, Computer Vision, Machine Learning, Introduction to Robotics*
- **Stony Brook University: Bachelors of Science**
  Double Major: Computer Science and Applied Mathematics *Sep 2015 - May 2020*
  Honors: *Graduated Cum Laude, University Scholars Program, Honors CS Program, CEAS Dean's Scholarship, Presidential Scholarship*

Experience

- **Research Assistant**: Stony Brook University (Full-time) *September 2020 - Present*
  - **Advisor**: Advised by Professor Michael Ryoo.
- **Netflix**: Research Intern (Part-time) *Aug 2025 - Present*
  - **Focus**: Video diffusion model research for VFX and production.
- **Google Research**: Student Researcher (Full-time) *Dec 2024 - Jun 2025*
  - **Project**: First-authored MotionV2V with Charles Herrmann, Forrester Cole, Neal Wadhwa, Andrey Voynov, and Nataniel Ruiz.
- **Eyeline Studios (Netflix)**: Research Intern under Paul Debevec (Full-time) *Feb 2024 - Jan 2025*
- **Adobe Research**: Research Intern under Brian Price (Full-time, then part-time) *May 2023 - Feb 2024*
  - **Project**: Accepted by CVPR 2024! Created MAGICK - a first large-scale text-to-image dataset for RGBA images, now also the current largest general purpose matting dataset - with over 150,000 text/image pairs. Will be released to public.
- **iRobot**: Machine Learning Intern (Full-time) *May 2020 - Aug 2020*
  - **Project**: Created photorealistic 3d training data using Blender and unpaired image translation algorithms.
  - **Impact**: The new training data yielded better real-world accuracy in object detection and classification tasks.
- **Zebra Technologies**: Computer Vision Intern (Full-time, then part-time) *May 2019 - Feb 2020*
  - **Project**: Used OpenCV and Python to create a new template matching algorithm, using contours instead of SIFT.
  - **Impact**: Outperformed company's previous implementation speed by factor of 30. See imgur.com/a/BOxxT6d
- **Zebra Technologies**: Computer Vision Intern (Full-time) *May 2018 - Aug 2018*
  - **Project**: Invented computer-vision system to track warehouse items for augmented reality applications. My key contribution to this project is now patented by Zebra. See imgur.com/a/eyFBoYJ
- **Air Techniques**: Software Engineering Intern (Full-time) *May 2017 - Aug 2017, Dec 2017 - Feb 2018*

Research

- **MotionV2V: Editing Motion in a Video**: First-author paper from Google. Enables precise video motion editing through sparse point trajectory manipulation. arxiv.org/abs/2511.20640
- **Go-with-the-Flow: Motion-Controllable Video Diffusion Models**: *CVPR 2025 Oral* (top 3% of submissions). First-author paper enabling motion control in video diffusion via real-time warped noise. cvpr.thecvf.com/virtual/2025/poster/33531
- **Diffusion Illusions: Hiding Images in Plain Sight**: *SIGGRAPH 2024, CVPR 2023 Best Demo Award.* First-author paper on text-to-image generation of optical illusions. Featured on Steve Mould (921K views, youtu.be/FMRi6pNAoag) and Matt Parker (686K views, youtu.be/b5nElEbbnfU). Exhibited at OpenSauce 2023-2025. diffusionillusions.com
- **MAGICK: A Large-scale Captioned Dataset from Matting Generated Images using Chroma Keying**: *Accepted to CVPR 2024!* First-author paper during Adobe internship. General method to turn RGB diffusion models into RGBA ones.
- **Peekaboo: Text to Image Diffusion Models are Zero-Shot Segmentors**: First-author paper, presented in CVPR 2023's O-DRUM workshop. We introduce a zero-shot, zero-training algorithm that segments regions of an image given a text prompt, using stable diffusion without any additional training. Our preprint: arxiv.org/pdf/2211.13224.pdf.
- **TRITON: Neural Neural Textures make Better Sim2Real**: First-author paper, accepted to CORL 2022. It combines neural textures with unpaired image translation to create better sim2real environments for robotics. Unlike previous approaches, TRITON provides temporal consistency over indefinite timescales. Our project website: tritonpaper.github.io.
- **Real-time Emotion Detection by Quantitative Facial Motion Analysis**: Accepted to the journal PLOS ONE. Designed an computer-vision algorithm to measure patients' facial micro-expressions, to determine coma severity both objectively and quantitatively, without any surgical procedures. For open access: www.medrxiv.org/content/10.1101/2022.10.28.22276059v1
- **Physics Research**: Co-authored "A Fish Out of Water: The Archer Fish's Rocket-Like Launch," presented at Gallery of Fluid Motion, 71st Annual Meeting of the APS Division of Fluid Dynamics, 2018. Created photorealistic animation using Blender 3D: youtu.be/auodWP98vas
- **Undergraduate Honors CS Thesis**: Designed custom 3D game engine, programming language, and editor using ThreeJS, React, and MongoDB. Lead a team of 9 students to create a web-based biomedical virtual laboratory, "Lab in a Cube," which provides a GUI for professors to create custom labs for their students. Presented in Conference on Instruction and Technology 2019, a statewide symposium. For a demo, open bit.ly/labinacube, click "load Lab", enter "ANNZ."

Projects

- **Lightwave**: Invented a portable synth instrument "The Lightwave": https://lightwave.website. Presented at OpenSauce 2023
- **CEWIT Hackathon**: Won two awards for "Know Before You Go"; used computer vision to find free parking spaces. Featured in *Newsday* and *The Statesman*
- **Light Painting Robot**: Robotic arm creates 3D artwork with long-exposure photographs. See youtu.be/6rcRQtEdCII.

Skills

- **Languages**: *(Proficient)*: Python, Java, JavaScript, MATLAB, C, C++ ; *(Familiar)*: C#, MIPS, LaTeX, SQL, Go
- **Libraries**: *(Unordered)*: PyTorch, OpenCV, ThreeJS, Node.JS, React, MPI, Prompt Toolkit
- **Software**: *(Unordered)*: Blender3D, Arduino, Git, Unreal Engine, Unity3D, Photoshop, Audacity, FL Studio, Jupyter

Awards

- **CVPR 2025 Demo Honorable Mention**: AI3D Render, with Yosun Chang. cvpr.thecvf.com/Conferences/2025/BestPapersDemos
- **ECCV 2024 Outstanding Reviewer**: eccv.ecva.net/Conferences/2024/Reviewers
- **CVPR 2023 Best Demo Award**: Diffusion Illusions. cvpr2023.thecvf.com/Conferences/2023/Awards