

Ezra Davis

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Education

- **Yale University**, New Haven, CT (2017-2019)
 - MS Degree in Computer Science focusing on computer graphics
- **Worcester Polytechnic Institute (WPI)**, Worcester, MA (2013-2017) (GPA: 3.9)
 - BS - Major in Computer Science
 - Minor - Electrical and Computer Engineering
 - Minor - Interactive Media and Game Development
- College courses during high school (2009-2013)
 - Cornell University, Ithaca New York (GPA: 4.3, 1 course)
 - Syracuse University, Maxwell School, Syracuse, NY (GPA: 4.0, 1 course)
 - Tompkins Cortland Community College (TC3), Dryden, NY (GPA: 4.0, 9 courses)
- New Roots Charter High School, Ithaca, NY (2009-2013) Graduated with “academic excellence”

Technical Skills and Training

- **Web Development:** Ruby on Rails, Angular and NGRX, Node.js, HTML, JavaScript and TypeScript, CSS and SCSS, Ember.js, D3.js visualizations, jQuery, PhantomJS headless browser
- **Mobile App Development:** iOS and Android app deploys using Ionic and AppFlow Live Updates
- **Cloud Computing:** OpenMP, Docker Containers, Amazon Web Services (AWS) cloud database DynamoDB, Elastic Containers Services (ECS), Simple Email Service (SES), Lambda, systems integration
- **Project Management:** Git version control and Gitflow branching pattern, Scrum Agile development approach, Kanban workflow, Trello and Jira task management, CI/CD Pipeline (Semaphore CI and GitHub Actions), Test Driven Design, Code reviewing and debugging, incident response, documentation of new features, computational complexity analysis, and working with QA
- **Programming Languages:** C, C++, Linux Kernel, Ruby, Java, JavaScript, TypeScript, Python, Racket (Lisp/Scheme family language), MATLAB, various object-oriented programming approaches
- **Data Visualization:** D3.js, Jupyter Notebooks, visualization theory and design techniques
- **Machine Learning & Computer Vision:** Keras, PyTorch, Convolutional Neural Networks for image analysis, Natural Language Processing, convex optimization algorithms, Support Vector Machines (SVM)
- **Graphics Programming:** OpenGL, WebGL, GLSL shading, Three.js, Game engine development
- **Data Analysis:** statistical techniques, mathematical modeling, data mining, database design, MySQL, PCA/SVD analysis
- **Embedded systems/Hardware/Computer Engineering:** Arduino programming, Verilog hardware description language on an FPGA, IA-32 (x86) assembly language, Soldering Printed Circuit Boards, Breadboard prototyping, Real Time OS
- **Human Computer Interface:** working with stakeholders and clients, usability design and testing, User Interface (UI) design principles, WCAG 2.1 Level AA accessibility compliance
- **3D Modeling:** Maya 3D animation, ZBrush 3D modeling, Blender, AutoCad, SketchUp
- **3D Printing:** Makerbot Replicator, LulzBot
- **2D Design and Art:** Photoshop, InDesign, Illustrator and other vector editors
- **Audio:** SuperCollider Audio programming synthesis and music composition, Reaper Digital Audio Workstation (DAW), Ableton Live DAW, Max/MSP visual programming
- **Educational:** Scratch, Alice programming environment, Ren'Py visual novel framework

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Work/Volunteer Experience

- Fall 2022
- present **Instacart, L5 Senior Engineer**, Rosie by Instacart, Ithaca, NY
After Instacart acquired Rosie, continued software development for local independent grocery stores. Served as tech lead on integrations showing Instacart ads and AppCard coupons within the Rosie website. Planned integrations with Instacart and Rosie teams.
- 2020-2022 **Rosie, Team Lead (2022)**, Ithaca, NY
Senior Software Engineer (2022)
Software Engineer (2020-2022)
Full-stack web developer at grocery e-commerce company providing websites and mobile apps for over 400 local independent grocery stores in 40 states. Working in a Scrum team, rewrote the entire browser-side shopping experience in Angular using NgRx and implemented SNAP/EBT payment functionality. Served on both front-end and back-end teams. Led additional projects using Ruby on Rails, JSON:API format, Grape, OpenAPI documentation, Sidekiq, and ActiveAdmin. Developed and deployed white-label mobile apps for individual grocery retailers using Ionic and AppFlow.
- 2017-2020 **Yale University, Graduate Researcher**, New Haven, CT
Developed a method to extract information from artist-drawn illustrations to create photorealistic digital materials (employing BRDFs). This approach could make it easier for digital artists to quickly create photorealistic surfaces for things like iridescent objects, velvet fabric, and objects with microstructures. Developed web user interface with JavaScript, used Python and Principle Component Analysis to reconstruct materials, and presented and published paper at Electronic Imaging symposium (2019).
- Spring 2019 **Yale University, Teaching Assistant for Data Visualization**, New Haven, CT
Graduate teaching assistant for Data and Information Visualization (CPSC 446/546) with Holly Rushmeier. Course topics included abstracting visualization tasks, using visual channels, spatial arrangements of data, navigation in visualization systems, using multiple views, filtering and aggregating data, and creating D3.js visualizations. Duties included rubric creation, advising students, helping them debug code, teaching, and grading.
- 2016-2017 **Worcester Polytechnic Institute (WPI) Senior Year Research Project**, Worcester, MA
Under the guidance of Xiangnan Kong, I worked with a team to create a programming toolkit to allow easy visualization of artificial neural networks. The toolkit focused on high-dimensional data such as medical scans, while still retaining the capability to analyze networks focused on simpler 2D images. The intent was to allow researchers to analyze the structure of an artificial neural network to determine which parts of the network are most essential, especially when the network employs convolutional layers. Implemented a variety of image visualization and data analysis techniques used for artificial intelligence computer vision algorithms.
- Fall 2016 **Worcester Polytechnic Institute, Teaching Assistant Computer Graphics**, Worcester, MA
Student teaching assistant for Computer Graphics (CS 4731) with Emmanuel Agu. Course topics included the homogeneous coordinate system, scene graphs, programmable shaders, and OpenGL programming. Duties included rubric creation, grading assignments and exams, advising, helping debug code, and working with students individually and in groups.

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Work/Volunteer Experience *continued*

- Summer 2016 **Cornell University, Software Engineering Intern**, Ithaca, NY
Built a system to generate emails with detailed personalized financial reports to faculty at Cornell University. This seemingly simple task involves passing the data and graphics through a complex multi-step process over several systems so it can be reliably and quickly be displayed on many email clients. Using a Docker Container virtual machine, I rendered an existing web application (see guide.pidash.cornell.edu), written using Ember.js and D3.js, with the PhantomJS headless browser. Wrote a Node.js script to extract and convert SVG graphics to create email-ready HTML with embedded images and inlined CSS. Emails can be reviewed through an admin website I developed using Node.js and Express.js. In this process I used git version control and Amazon's cloud database DynamoDB, Elastic Containers Services (ECS), and Simple Email Service (SES).
- Spring 2016 **Design Museum, Project-based Intern**, London, England, www.designmuseum.org
Designed, developed, and implemented STEAM (Science, Technology, Engineering, Art, and Math) educational resources for the London Design Museum's new Designer/Maker/User exhibition with a small interdisciplinary team of WPI students. Tested and evaluated the activities with primary school teachers and their students. Worked closely with museum staff and curriculum stakeholders.
- Summer 2015 **Sprout Patterns, Software Engineering Intern**, Durham, NC
Designed and implemented website for startup company that printed sewing patterns onto fabric with custom designs. Worked with small team to build Ruby on Rails website and customer interface with 2D and 3D previews and could connect with separate fabric printing website (spoonflower.com). Used Ruby on Rails, HTML, JavaScript, Blender, Three.js, WebGL, and ImageMagick.
- Summer 2014 **Wicked Device, Engineering Intern**, Ithaca, NY, www.wickeddevice.com
Engineering internship for startup company that designs and builds embedded electronics, including several internet-enabled sensor packages like the Air Quality Egg. Project focused on creating a new integrated system of wireless Arduino-compatible carbon dioxide sensors and a corresponding Ruby on Rails website to receive and display readings from the sensors. Programmed Arduinos, designed prototype devices using existing sensors to integrate with the website over Wi-Fi; I also participated in all-hands-on-deck tasks including soldering printed circuit boards for commercial products.
- Summer 2013 **Spoonflower, Software Engineering Intern**, Durham, NC, www.spoonflower.com
Summer 2012 Internships for online custom-fabric printing company. Worked the first summer with small team to develop ways for customers to view 3D models wrapped in custom fabric on website. Developed tools to allow customers to choose fabric and adjust pattern size on different objects such as an upholstered chair and wrapping paper on a gift box. Worked the second summer to improve image processing and allow images to load more quickly and reliably. Used Ruby on Rails, HTML, JavaScript, Blender, Three.js, WebGL, and ImageMagick.
- Summer 2012 **Summer Math Camp, Teaching Assistant**, Ithaca, NY
Paid teaching assistant internship for Family Math one-week summer camp organized by Ithaca College mathematics professor Dani Novak. The camp was designed to introduce children ages 6-10 to computer programming, and relationships between math and art.
- 2008-2013 **Earth Arts, Coyote Mentor, Volunteer**, Ithaca, NY, www.earthartsithaca.org
Participated in mentor training activities year-round; served as camp counselor several weeks during summers of 2009, 2010, and 2011; summer camp for elementary and middle-school-aged children focused on outdoor naturalist awareness, primitive skills, and community building activities.
- 2009-2011 **Lifelong senior citizen center, Volunteer**, Ithaca, NY, www.tclifelong.org
Provided technology training and trouble-shooting for senior citizens including using email and internet tech support as high school community service project.

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Work/Volunteer Experience *continued*

- 2010 **Finger Lakes Reuse Center, Volunteer**, Ithaca, NY, www.fingerlakesreuse.org
Dismantled obsolete computers to prepare components for recycling or reuse when possible.
- 2009-2010 **Ithaca Youth Bureau, Computer All Stars, Volunteer**, Ithaca, NY
Diagnosed, repaired, and upgraded older equipment to provide computers to local families.
Dismantled components for recycling; installed software in refurbished computers.
- 2006-2009 **Fall Creek School Age Program, Junior Counselor, Volunteer**, Ithaca, NY
Worked in afterschool program with elementary school-aged children in a variety of activities including: homework help, supervising outdoor play, crafts, and cleanup.
- 2006-2010 **Cayuga Nature Center, Volunteer**, Ithaca, NY, www.cayuganaturecenter.org
Volunteered at educational outreach events such as the Maple Festival; assisted in installation of exhibits and outdoor art sculptures.
- 2008 **Sciencenter, Junior Counselor, Volunteer**, Ithaca, NY, www.sciencenter.org
Volunteered as junior counselor for local science museum during Winter and Spring week-long science camps for elementary school-aged children.

Awards

- 2013-17: Worcester Polytechnic Institute *Dean's List*
- 2013-17: Worcester Polytechnic Institute *Presidential Scholar*
- 2013-14: Worcester Polytechnic Institute *Charles O. Thompson Scholar*
- 2013: New Roots Charter High School, *Certificate of Excellence - Motivation & Multidisciplinary Brilliance*
- 2012: New Roots Charter High School, *The Alexander Graham Bell Award for Inventiveness and Communication, Math award, Sustainability and History award*
- 2011: National Merit Scholarship Semifinalist
- 2008: National Junior Honor Society
- 2006-2009: Boynton Middle School, *Honor Roll, Student of the Quarter award*

Publications and Conference Presentations

- E. Davis, W. Shi, H. Rushmeier, J. Dorsey, and H. Wu. (2019) Image-based BRDF Design, *IS&T International Symposium on Electronic Imaging*, Volume 2019.
- E. Davis, Conference presentation (January 15, 2019) Image-based BRDF Design. Electronic Imaging 2019 Symposium, Material Appearance conference, Society for Imaging Science and Technology, Burlingame CA.

More about me

- I enjoy being part of a community and working collaboratively. I attended WPI largely due to the school's emphasis on collaborative project-based learning. I joined New Roots Charter High School for its focus on community and sustainability. I was born and raised in a Co-Housing community called Muir Commons in Davis, CA.
- I enjoy learning about science, computer programming, and math.
- In my free time, I am an avid reader and I enjoy playing the viola and violin fiddle music, board games, Ultimate Frisbee, table tennis, and being outdoors.