David Abramov

davs.abramov@gmail.com | (708) 244-7729 | 140 Bay St Apt 3, Santa Cruz, CA 95060

Education

M.S./Ph.D. Student in Computational Media | September 2018 - Present
University of California Santa Cruz, Jack Baskin School of Engineering

Master of Science in Predictive Analytics | January - June 2018 | 4.0/4.0 GPA
DePaul University, College of Computing and Digital Media (dnc)

Bachelor of Science in Physics | September 2013 - June 2017 | 3.8/4.0 GPA
DePaul University, College of Science & Health

Bachelor of Science in Biology | September 2013 - June 2017 | 3.8/4.0 GPA
DePaul University, College of Science & Health

Research Experience

CosmoVis | Lead Developer, UI/UX Designer | Creative Coding Lab, UCSC | Fall 2019 - Present

- Designed and developed a web-based interactive 3D visualization and analysis tool for large scale hydrodynamic cosmological datasets in collaboration with an associate professor in the Department of Astronomy at New Mexico State University.
- Programmed a data wrangling pipeline in Python, created a Flask application for on-demand server-side computations, which are triggered by user interaction through web-based front-end interface coded in HTML/Javascript/CSS, relying on the libraries THREE.js and D3.js. Run/test the software locally, hosted on AWS EC2 Ubuntu server.
- Working on an applications paper submission for IEEE VIS 2021 as first author. Presented on *CosmoVis* at the *RHytHM: ResearcH using yt* mini conference (2020).

CS Lead Data Visualization Intern | JPL + Caltech + ArtCenter | Pasadena, CA | Summer 2019

- Worked as a Computer Science Lead with a research group at JPL to help visualize results from simulations of a spacecraft concept that would collect gas from the upper atmosphere of Venus while traveling at hypervelocity.
- Cleaned and processed large datasets into a more manageable format for visualization.
- Developed a prototype web application through an iterative design process consisting of domain expert interviews in order to understand the science team's needs, along with weekly critique sessions from design and UX experts.

David Abramov

davs.abramov@gmail.com | (708) 244-7729 | 140 Bay St Apt 3, Santa Cruz, CA 95060

RuleVis | Lead Developer + UI/UX Designer | Creative Coding Lab, UCSC | Winter - Spring 2019

- Worked as a project manager coordinating between research collaborators at Harvard Medical School and other computer science and design students. Was the first author on a short paper published in VIS 2019. [https://arxiv.org/abs/1911.04638]
- Coordinated meetings between several graduate students and an undergraduate student in developing a web-based graphical biological rule building tool that quickly converts between the graphical user interface, visual representation, and corresponding *Kappa* syntax.
- Accepted as a short paper at the IEEE VIS 2019 conference (first author) and gave a presentation in Vancouver.

IGM-Vis | Lead Developer + UI/UX Designer | Creative Coding Lab, UCSC | Fall 2018

- Collaborated with Astrophysics postdoc to develop a web-based software tool for comparing Hubble Space Telescope spectral observations to the known location of galaxies obtained from the SDSS catalog, with domain expert user evaluation.
- Used d3.js to load and process data, and THREE.js to display galaxies and spectral skewers in cartesian coordinates.
- Full paper published in EuroVis 2019. Paper presentation in June 2019 in Porto, Portugal. [https://arxiv.org/abs/1812.07092]

UC Santa Cruz Creative Coding Lab | Graduate Student Researcher | Fall 2018 - Present

- Collaborated with a postdoc in the Astronomy & Astrophysics Department (now Associate Professor at New Mexico State University) as lead developer on *IGM-Vis* and *CosmoVis*, two web applications for visualizing and analyzing astronomical observation and simulation data. A paper for *IGM-Vis* was accepted to the EuroVis 2019 conference; a paper submission is in the works for *CosmoVis* for IEEE VIS 2021.
- Collaborated with researchers at Harvard on a tool to generate dynamic biochemical pathway visualizations for interactive figure generation using the *Kappa* language syntax and Javascript libraries.
- Updating legacy code for an art installation called DenseVOS with George Legrady.

Pocket Farms | DePaul Purpose Pitch Competition Semifinalist | Chicago, IL | Spring 2017

- Developed and proposed an idea for a lightweight, portable aeroponic greenhouse system that would self-regulate environmental conditions for optimal plant growing, with an emphasis on being deployed in underutilized neighborhoods across the city.
- Drafted and annotated sketches in AutoCAD, rendered 3D model in Autodesk Fusion.
- Estimated cost of construction would have been less than the $20,000 prize.
- Led a team of college students in putting together a budget proposal, presentation and design ideas.

David Abramov

davs.abramov@gmail.com | (708) 244-7729 | 140 Bay St Apt 3, Santa Cruz, CA 95060

Adler Planetarium | Far Horizons Lab Intern | Chicago, IL | Summer 2016

- Designed and engineered an autonomous pressure-sensitive altitude adjustment system to be used for high altitude helium-filled weather balloon experiments.
- Designed, prototyped, and tested design on weather balloon launches from a small aircraft hangar and runway in Kankakee, IL. Used telemetry to locate and retrieve payload.
- Used C Code for Arduino, EAGLE for circuit board design, Autodesk and Makerbot for 3D design and printing, and Excel and Matlab for data analysis and visualization.
- Created a blog to showcase the process behind the project.

Undergraduate Biology Lab Assistant | DePaul University | Chicago, IL | 2014 – 2016

- Lab projects focused on comparative vertebrate physiology at a cellular and molecular level, with a particular interest in how aquatic animals adapt to changing environmental conditions.
- Duties included quantitatively measuring gill enzyme activity through spectrophotometric assays, measuring oxygen consumption rates of live aquatic vertebrates (goldfish and tadpoles) under various conditions. Designed and maintained small respirometers to measure tadpole respiration.
- Was responsible for water chemistry measurements, pipetting, centrifugation, and data analysis in Excel and Matlab. Handled live animals and tissue samples, participated in scientific literature review and presenting data. Participated in a paid Undergraduate Summer Research Program (2015) at a Loyola University ecology lab.

Professional Experience

Teaching Assistant for ***Musical Data*** | UCSC | Santa Cruz, CA | Spring Quarter 2021

- Attend class one day per week, hold one lab section per week and be available for three office hours per week.
- Prepare material, maintain grades and grade one paper per student.

Teaching Assistant for ***Creating Digital Audio*** | UCSC | Santa Cruz, CA | Winter Quarter 2021

- Attended lectures and held two office hour sessions per week over Zoom.
- Presented a 45 minute lecture on Psychoacoustics. Assisted students in completing their projects using the digital audio workstation software Reaper.
- Graded a dozen reading assignments and recorded several minutes of video critique for three class creative audio projects.

David Abramov

davs.abramov@gmail.com | (708) 244-7729 | 140 Bay St Apt 3, Santa Cruz, CA 95060

Teaching Assistant for ***Intro to Computer Graphics*** | UCSC | Santa Cruz, CA | Spring 2019

- Taught two lab sections covering the rendering pipeline in computer graphics through programming exercises in Unity.
- The class met twice a week and had about 25 students per class. Attended lectures twice per week to remain on page with the content of the class, answered questions on Slack, and was open to scheduling office hours with students as needed.
- Used an active learning teaching style to maximize student engagement coding shaders during class.

Clinical Data Analyst | Tempus Labs | Chicago, IL | Fall 2017 – Fall 2018

- Cleaned, structured and coded hundreds of data points for thousands of cancer patients from clinical progress notes from electronic medical records for research and pharmaceutical clients.
- Abstracted data and performed quality assurance for creation of treatment timelines of patients with lung, breast and ovarian cancer.
- Used python's natural language toolkit package to format hear to read, unstructured clinical text files, which increased productivity.
- Tested and reported bugs in the abstraction environment for the product software development team.
- Performed data analysis and visualization on publicly available cancer datasets with survival analysis plots in R.

Collateral Officer | Guaranteed Rate | Chicago, IL | Summer - Fall 2017

- Ensured all loan paperwork for dozens of signed and executed mortgage packages were adequately accounted for before packaging and mailing to investment banks purchasing these assets to collect on monthly payments to term.
- Worked closely with other team members to finish in a timely manner daily.
- Communicated with outside title offices and real estate attorneys offices to request missing documentation. Identified loan packages that needed to be resigned.

Paper Submissions

Abramov, David, Joseph N. Burchett, Oskar Elek, Cameron Hummels, J. Xavier Prochaska, Angus G. Forbes. "CosmoVis: Visualizing Hydrodynamic Cosmological Simulations at Galactic and Intergalactic Scales." Abstract submitted to ***2021 IEEE Visualization Conference (VIS)***. 2021.

David Abramov

davs.abramov@gmail.com | (708) 244-7729 | 140 Bay St Apt 3, Santa Cruz, CA 95060

Paper Publications

Abramov, David, Jasmine Otto, Mahika Dubey, Cassia Artanegara, Pierre Boutillier, Walter Fontana, and Angus G. Forbes. "RuleVis: Constructing Patterns and Rules for Rule-Based Models." In ***2019 IEEE Visualization Conference (VIS)***, pp. 191-195. IEEE, 2019.

Burchett, Joseph N., David Abramov, Jasmine Otto, Cassia Artanegara, J. Xavier Prochaska, and Angus G. Forbes. "IGM-Vis: Analyzing Intergalactic and Circumgalactic Medium Absorption Using Quasar Sightlines in a Cosmic Web Context." In ***Computer Graphics Forum***, vol. 38, no. 3, pp. 491-504. 2019.

Poster Presentations

Burchett, Joseph N., David Abramov, Jasmine Otto, Cassia Artanegara, J. Forbes, and G. Angus. (2019). "IGMVis: Analyzing Intergalactic and Circumgalactic Medium Absorption Using Quasar Sightlines in a Cosmic Web Context." UCSC Data Science Day, Santa Cruz, CA.

David Abramov, Jason Bystriansky, Ciaran Shaughnessy. (2015). "Gill Na+/K+-ATPase activity across a pH gradient in two-year old white sturgeon (Acipenser transmontanus) during aquatic hypercarbia and elevated salinity." Chicago Area Undergraduate Research Symposium, Chicago, IL.

David Abramov, Joseph R. Milanovich, Jason Bystriansky. (2015). "Impact of the Invasive Purple Loosetrife (Lythrum salicaria) on the Growth, Metabolism and Metamorphosis of Grey Treefrogs (Hyla versicolor)." DePaul College of Science and Health Research Showcase, Chicago, IL.

Artistic Work

DenseVOS [Voice of Sisyphus], Creative Coder | Creative Coding Lab | Summer 2020 - Present

- Updated legacy C++/Processing/Python code for an industrial noise aesthetic audio visual art exhibition installation (VOS) to include livestream video from a webcam and real time object recognition with the DenseCap detection neural network.
- This work is to be presented as an art installation in Beijing Winter 2021-2022.
- Recently submitted to the TVCG Arts track to be included as an art installation.

David Abramov

davs.abramov@gmail.com | (708) 244-7729 | 140 Bay St Apt 3, Santa Cruz, CA 95060

Musician, Performer, Producer, Technical Assistant | The Tapestries Collective | 2017 - Present

- Wrote and performed guitar for "Love Was the Motive…" on the "To Be Black Show" podcast, July 2017
- Wrote and produced music for several songs, including "In Our Time," which was featured in Episode 6 of "THE AGENCY," an indie YouTube miniseries.

Throw Me Away | UCSC Digital Arts and New Media | Fall 2018

- Created a two minute looping glitch-art aesthetic audiovisual installation composed of original and found footage that was obliterated using data moshing techniques.
- The video shows the journey of an iPhone from factory to its demise, accompanied by eerie echoes of SIRI instructing the viewer to "Throw me away."
- The video includes footage recorded during a personal tour of the City of Santa Cruz Resource Recovery Center.
- Looping audiovisual installation was presented at UCSC Digital Art and New Media showcase on a 72" display Fall 2018.

CXL | Short Film | DePaul University | Chicago, IL | 2016

- Synopsis: *After celebrating her 140th birthday, Martha must come to terms with the reality of death.*
- Assisted production designer with creating drafting blueprints of the set design in AutoCAD. Took measurements of the space and scenic pieces that needed to be modified. Assisted film crew in constructing and piecing together the set in the soundstage.

Shattered Globe Theatre Company | Artistic Associate | Chicago, IL | Summer 2013 – Fall 2018

- Assistant Scenic Designer – Digitized hand-drafted ground plans made by scenic designer in AutoCAD
- Assistant Stage Manager – Helped stage manager with resetting the space before and after each performance, assisted actors by preparing props and costumes, and worked under pressure during time-sensitive transitions.
- Carpenter / Electrician / Rigger – Handled power tools to construct sets following safety protocol; focused and repaired lighting instruments; safely and securely set-up scenery, curtains and piping.
- Office Assistant - Scanned, organized, and cataloged donations from restaurants and businesses in a Google spreadsheet for the company's annual silent-auction soiree fundraiser.

David Abramov

davs.abramov@gmail.com | (708) 244-7729 | 140 Bay St Apt 3, Santa Cruz, CA 95060

Statistics and Computer Skills

Analytics:

- Cluster analysis
- Data mining, preprocessing and cleaning
- Decision trees
- Interactive data visualization (2D + 3D)
- Linear & logistic regressions
- Machine learning algorithms
- NLP sentiment analysis
- Training and using neural networks

Code:

- Arduino, C++, HTML/CSS/Javascript, Java, Julia, LaTeX, Matlab, OpenFrameworks, Processing, Python, R, Raspberry Pi, SQL, WebGL+OpenGL Vertex+Fragment Shaders
- Github

Design:

- Adobe Creative Suite, AutoDesk Software (AutoCAD, Fusion 360, Revit), digital photography + video recording and editing, Unity, 3D modeling and printing.

Office:

- Proficient with Apple, Android, Google Apps, Linux, Microsoft Office Suite, Windows, social media

Web frameworks, server configuration, and communication protocols:

- Apache, AWS (EC2 + S3), Flask, OSC, Socket.io

Honors and Awards

- IEEE VIS SciVis Data Challenge Winner (2020)
- Grow With Google Web Design Scholarship Challenge (2018)
- Graduated with Honors - *Magna Cum Laude* (2017)
- DePaul Presidential Scholar Award (All Quarters in Attendance)
- Dean's List (All Quarters in Attendance, DePaul)
- Undergraduate Research Fellowship, Adler Planetarium (2016)
- James J. Vasa Memorial Scholarship (2016)
- Reverend Charles F. Shelby Endowed Physics Scholarship (2016)
- Reverend John R. Cortelyou C.M. Memorial Scholarship (2016)

David Abramov

davs.abramov@gmail.com | (708) 244-7729 | 140 Bay St Apt 3, Santa Cruz, CA 95060

Professional Affiliations

National Society of Collegiate Scholars
American Physical Society