Aaron Shukert

Mathematician ⋄ Software Engineer

720-936-9433 ⋄ shukertaaron@gmail.com

EDUCATION

Colorado State University August 2016 - May 2019
Bachelor of Science in Applied Mathematics, *Cum Laude*
Minor: Physics

ACADEMIC AWARDS

Joint Math Meetings, Baltimore, MD. 2019
Outstanding Poster Award in Dynamical Systems for *Hyperbolic Mandelbrot and Julia Sets.*

Department of Mathematics Poster Session, Colorado State University. 2019
Best Poster Award for *Differential Galois Theory.*

Department of Mathematics Poster Session, Colorado State University. 2018
Best Poster Award for *Generation of Random Planar Equilateral Polygons.*

Colorado State University Green and Gold Scholarship 2016 - 2019

Colorado State University Partnership Award 2016 - 2019

PUBLICATIONS

2. Vance Blankers, Tristan Rendfrey, Aaron Shukert, and Patrick Shipman, Julia and Mandelbrot Sets for Dynamics over the Hyperbolic Numbers, Fractal and Fractional 3 (2019), 6.
   `https://doi.org/10.3390/fractalfract3010006`

1. Laney Bowden, Andrea Haynes, Clayton Shonkwiler, and Aaron Shukert, Spherical Geometry and the Least Symmetric Triangle, Geometriae Dedicata 198 (2019), 19-34.
   `https://doi.org/10.1007/s10711-018-0327-4`.

PRESENTATIONS

Talks

Spherical Geometry and the Least Symmetric Triangle
AMS Session on Topology and Geometry, Joint Math Meetings, San Diego, CA 2018

Poster Presentations

Differential Galois Theory, Colorado State University 2019
Hyperbolic Mandelbrot and Julia Sets, Joint Math Meetings. Baltimore, MD 2019
Simplicial Homology, Colorado State University 2018
Generation of Random Planar Equilateral Polygons, Colorado State University 2018

RESEARCH EXPERIENCE

Laboratory for Mathematics in the Sciences October 2018 - December 2018
Undergraduate Research Mathematician

· Researched the impact of electrical charge on the formation of chemical microtornados when reacting hydrogen chloride (HCl) and ammonia (NH_3) to form the aerosol ammonium chloride (NH_4Cl).

Department of Mathematics, CSU   June 2018 - July 2018
Undergraduate Research Mathematician

· Developed numerical algorithms and data visualization in both C and MATLAB in the investigation of discrete time dynamics over the hyperbolic numbers.
· Investigated improving modern computational topology algorithms using Fourier methods.

Shonkwiler Research Group   April 2017 - May 2018
Undergraduate Research Mathematician

· Studied n-gons through their representation as points on the Grassmannian of 2-planes in $\mathbb{R}^n$.
· Aimed to classify n-gons as convex, concave, or self intersecting based on properties of their Plücker coordinates.
· Developed methods to study symmetry of polygons with our results mirrored by research studying chemical chirality.
· Created a method to generate planar equilateral polygons with application to polymer chemistry.

ADDITIONAL EXPERIENCE

Phase Three Product Development   June 2019 - December 2019
Contract Software Engineer

· Designed and delivered software used to stabilize droplet streams and recognize fluidic errors in flow cytometry. Image recognition and control algorithms were developed using C, C^{++}.
· High-speed software communication between computer, camera, and an Intel FPGA for droplet control.
· Built an interactive GUI using OpenCV to monitor and troubleshoot software/fluidics problems.

CSU Math Club   December 2018 - May 2019
Vice President

· Assisted in planning weekly meetings which taught students various topics in math.
· Organized events such as guest lectures and a bi-annual math department picnic.

CSU College of Health and Human Sciences   August 2016 - October 2018
Helpdesk Specialist

· Worked in a team of eight to help faculty and students with their tech needs.
· Repaired hardware for computers, laptops, and other electronics.
· Resolved a variety of software issues including corrupt software, lost data, and networking issues.