Jonas P. Knochelmann

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Summary

Self driven and independent computer science undergraduate researcher, with years of experience in **programming** and **problem solving**. Experience in **research**, **professional software development**, **teaching**, and **presenting work** in academic settings. Member of the Quantitative Experience Design lab at the University of Utah with one **peer-reviewed research paper** published.

Skills

- Computer Programming
- Academic Research
- Problem Solving
- Scientific Writing
- Communication

- Algorithms/Data Structures
- Design Patterns
- Software
- Mathematics
- Artificial Intelligence

Projects

- **Bronco** — Programming Language, Library, IDE
  github.com/qed-lab/Bronco-Text-Generator
  As an **undergraduate researcher**, I researched, designed, and implemented this **programming language**, which allows users to author text generators. This includes a **parser** made with **ANTLR**, a **C#** library for accessing the backend, and a **custom IDE**.

- **BIT4D** — Library
  github.com/JonasPKnoch/BIT4D
  A library for **rendering** 4-Dimensional geometry with the slicing technique in the **Godot** game engine. Using **optimized GPU code** to quickly render objects from a **custom file format**, complete with texturing, shading, and a usable **API**.

- **4D Axonometric Renderer** — Applet
  github.com/JonasPKnoch/4DAxonometric
  A **Java** project made in **Open Processing**, that renders 4-Dimensional shapes using an original and flexible technique. Utilizes **object oriented design** for an easy to use toolset, including **saving/loading files**, and rendering in multiple styles.

- **Colder On Mars** — Web Applet
  colder-on-mars.s3-us-west-1.amazonaws.com/index.html
  A **JavaScript** project making use of many **APIs**, and **XML** and **JSON** requests. Hosted in **AWS S3** and made in **P5.js**, combines multiple APIs and fallbacks for a reliable service with error feedback.

Publications

- **Bronco: A Universal Authoring Language for Controllable Text Generation** — International Conference on Interactive Digital Storytelling 2022
  jonaspknoch.github.io/files/knochelmann2022bronco.pdf
  A paper describing the motivation, design, and implementation of the Bronco programming language.

- **GTPCG: Generating Objects from Mathematical Description** — Conference on Artificial Intelligence and Interactive Digital Entertainment 2023 (Rejected)
  jonaspknoch.github.io/files/GTPCG.pdf
  A paper describing the basics of group theory for procedural content generation, exploring the

principles, several case studies, and implementation.

- **Exploring group theory for use in procedural content generation** — University of Utah
  Poster Session
  jonaspknoch.github.io/files/GTPCG%20Poster.pdf
  A poster showing the motivation and principles behind the "group theory for procedural content generation" research project.

Experience

- **Undergraduate Research Engineer** —University of Utah (current)
  Here, I am responsible for **conducting research**, either **independently** or as directed by a mentor or colleague. This has involved extensive **literature** reading, **software engineering**, pen and paper **problem solving** and **communicating with established figures** in the field. This work has also allowed me to **publish and present a peer-reviewed research paper**.

- **Corporate Trainer, Web Development** — Salt Lake Community College
  In this position, I was responsible for **teaching** basic **web development** to a **diverse** body of students towards a Web Development Certificate. This involved preparing class material, **delivering 3-hour lessons**, and assisting with any questions students have. The class material covered **version control** and the full range of **front end** to **back end development**.

- **Lab Aide, Programming Languages** — Salt Lake Community College
  Here, I was responsible for assisting in **corporate training** of **programming languages**. This meant answering student questions, adding insights or clarifications to lessons, and **communicating consistently** with students and staff.

- **Data Entry Programmer** — Eptura
  At this position, I was contracted to assist in various **data entry** tasks relating to the iOffice products. This primarily involves **modifying code**, managing **version control**, and **writing tools** to speed up and **automate** my work.

Education

- **Bachelor's in Computer Science (In Progress)** —University of Utah
  SLCC and the U of U have provided quality education in general areas such as **English** and **mathematics**, and in **computer science** and **software development**.

- **High School Diploma** — American Academy of Innovation
  The American Academy of Innovation allowed **concurrent enrollment**, along with the diploma and a general base of knowledge.

References

- **Rogelio E. Cardona Rivera** — Advisor — Professor of Computer Science
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- **Ian Horswill** — Colleague — Professor of Computer Science
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- **Max Kreminski** — Colleague — Professor of Computer Science
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- **Robert Maxwell** — Student — Job Coach
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