

John Rathgeber

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EDUCATION

Brown University, *Sc.B. Mathematics-Computer Science, A.B. Music*

Providence, RI | **May 2027**

- **GPA: 3.9**
- **Computer Science Courses:** Design and Analysis of Algorithms, Machine Learning, Database Management Systems, Computer Vision, Fundamentals of Computer Systems, Accelerated Introduction to Computer Science, Discrete Structures and Probability
- **Mathematics Courses:** Abstract Algebra, Differential Geometry, Analysis, Honors Multivariable Calculus, Honors Linear Algebra, Logic

EXPERIENCE

Electronic Theatre Controls (ETC), *Software Engineer Intern*

Middleton, WI | May 2025 – Present

- Built real-time configuration file management for ETC SiteLink using **Python** and **PostgreSQL**, enabling users to retrieve, update, and receive live status updates through **Swagger**-documented **RESTful APIs**, **MQTT** and **HTTP**-based message exchange, and **TypeScript** frontend hooks.
- Added support for displaying offline devices by designing a new unique key system in **PostgreSQL** and implementing **multithreaded** backend processing, enabling consistent tracking and automatic association upon **IP multicast** discovery with full frontend representation via **React**.
- Wrote unit and property-based tests in **Python** and **TypeScript** using **Mocha** to validate backend logic and frontend integration, and contributed to **Docker/Kubernetes** build workflows by running full system builds for merged development branches.

Full Stack at Brown, *Website Developer*

Providence, RI | September 2024 – Present

- Collaborate with a small team of developers and designers to build and maintain websites for various organizations at Brown University using **Next.js**, **Express.js**, **React**, **Typescript**, **HTML**, and **CSS**.
- Applied acquired web development skills to design and build a personal website, johnrathgeber.com.

Wisconsin Department of Transportation

Computer Vision Intern

Madison, WI | May 2024 – August 2024

- Developed a **Python** algorithm to accurately **estimate 3D positions** of street signs across Wisconsin from a dataset of over **3 million** images taken from a moving vehicle, pioneering a unique solution in the department and enabling the state to map each and every traffic sign in Wisconsin.
- Applied computer vision techniques using **YOLOv5** for traffic sign detection and **DepthAnything V2** for depth map generation, combined with **linear algebra** methods to optimize geotagging, automating a previously manual process and significantly **improving efficiency**.

SoilNet, *Data Science Intern*

Belleville, WI | May 2024 – August 2024

- Maintained and developed a company database using **SQL**, **stored procedures**, automated **RESTful API** queries with **Javascript**, and **ETL processes**, ensuring up-to-date and accurate data management.
- Collaborated with a team of data scientists to analyze soil and plant analysis data, culminating in a final presentation to stakeholders highlighting key insights and recommendations for agricultural planning.
- Contributed to a multi-disciplinary project that formed the backbone of a **\$1 million** SBIR federal proposal grant to the USDA.

PROJECTS

Tumor Detection, *Python, Keras, Tensorflow*

Providence, RI | September 2024 – December 2024

- Built and trained a **Convolutional Neural Network (CNN)** brain tumor classification model in **Python** with **TensorFlow**, **Keras**, and a **VGG-16** backbone, exceeding **95%** accuracy on MRI scan data.
- Implemented **LIME** and **saliency maps** to visualize model decision-making and highlight regions of interest in MRI scans to indicate where a tumor may be present.
- Utilized publicly available Kaggle datasets to preprocess, train, and validate the CNN model.

SKILLS

Languages: Python, C/C++, JavaScript, TypeScript, Java, SQL, HTML/CSS

Libraries/Frameworks: Node.js, Express.js, React, Flask, PyTorch, Tensorflow, Keras, OpenCV, Tailwind, NumPy

Tools: VS Code, Git, Docker, DBEaver, pgAdmin, Firebase, Postman, Swagger, Vercel, IntelliJ, Jira

Interests: Piano, Golf, Tennis, Weightlifting, Chess, Competitive Programming