Gabriel Selzer

(608) 509-5506 | gabrieljamesselzer@gmail.com | gselzer.github.io

Experience

Software Engineer May 2024 – Present
Eliceiri Lab (LOCI), University of Wisconsin-Madison *Madison, WI*
- Collaborated with Harvard Medical School to extract ndv from internal component into a reusable standalone library
- Built histogram visualization for real-time microscope tuning based on user research with imaging scientists
- Developed GitHub Actions CI/CD pipelines, automating testing and documentation deployment with 80%+ coverage requirements

(Graduate) Research Assistant Aug 2017 – May 2024
Eliceiri Lab (LOCI), University of Wisconsin-Madison *Madison, WI*
- Led development of napari-imagej in collaboration with Chan Zuckerberg Initiative, enabling napari users to access Fiji's tools without Java expertise
- Architected SciJava Ops declarative algorithms framework, targeted for inclusion in Fiji core, reaching thousands of daily users

Projects

ndv Jun 2024 – Present
n-dimensional data viewer *Python, VisPy, Qt*
- Co-developed an MVC architecture enabling usage from PyQt, Jupyter, and WxPython backed by VisPy or pygfx
- Implemented asynchronous, multi-channel histogram visualization, handling complex, remote, and/or large datasets
- **Impact: 81 Github stars, approximately 1000 downloads per month, central component of pymmcore-gui**

napari-imagej Dec 2021 – Aug 2023
Interoperable user interface bridging napari and Fiji/ImageJ *Python, Java, napari, Fiji*
- Leveraged zero-copy data conversions between ImageJ and NumPy for high-performance interoperability
- Engineered asynchronous ImageJ2 initialization with Qt QThreads to avoid seconds to minutes of UI blocking
- Implemented automatic UI generation for Fiji plugins, enabling invocation as if they were native Python functions
- **Impact: 31 Github stars, approximately 80 downloads per month, communications paper published in Nature Methods**

SciJava Ops Apr 2018 – Sep 2024
Declarative Image Processing for Fiji/ImageJ *Java 11, Fiji, OpenCV*
- Designed declarative algorithm discovery and invocation across multiple libraries (ImageJ, OpenCV, NumPy)
- Implemented type-based algorithm routing with automatic data conversion, enabling data-structure-agnostic invocation
- **Impact: Slated for inclusion in Core Fiji, Paper published in Frontiers in Bioinformatics**

Education

University of Wisconsin, Madison Madison, WI
Computer Science, M.S. *May 2024*
Electrical Engineering, B.S. *Dec 2021*
Computer Science, B.S. *Dec 2021*

Publications

G. J. Selzer et al., "Scijava ops: an improved algorithms framework for fiji and beyond", Frontiers in Bioinformatics **Volume 4 - 2024**, 10.3389/fbinf.2024.1435733 (2024).

G. Selzer et al., "Napari-imagej: imagej ecosystem access from napari", Nature Methods **20**, 1443–1444 (2023).

N. A. Gahm et al., "New extensibility and scripting tools in the imagej ecosystem", Current Protocols **1**, e204 (2021).

Technical Skills

Professional: Python, Java, Git/GitHub, IntelliJ, VSCode, Qt, Unix, Jupyter, GitHub Actions, JUnit 4/5, pytest, Maven, setuptools

Academic/Hobbyist: Tensorflow, PyTorch, Rust, C/C++, WebGPU, Javascript/HTML/CSS, CUDA