Gabriel Selzer

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Experience

Software Engineer May 2024 – Present
Eliceiri Lab (LOCI), University of Wisconsin-Madison *Madison, WI*

- Extracted ndv from internal component to standalone library, enabling reuse across bio-image tools
- Built histogram visualization for real-time microscope tuning based on user research with imaging scientists

(Graduate) Research Assistant Aug 2017 – May 2024
Eliceiri Lab (LOCI), University of Wisconsin-Madison *Madison, WI*

- Built napari-imagej, enabling napari users to access Fiji's decades of image processing 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 declarative, evented data model
- Developed histogram view for real-time data analysis
- **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*

- Engineered a unified syntax for algorithm invocation, covering ImageJ, OpenCV, and NumPy
- Engineered an abstract plugin discovery system with backends in YAML and Java's JPMS
- **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, C. T. Rueden, M. C. Hiner, E. L. Evans, D. Kolb, M. Wiedenmann, C. Birkhold, T.-O. Buchholz, S. Helfrich, B. Northan, A. Walter, J. Schindelin, T. Pietzsch, S. Saalfeld, M. R. Berthold, and K. W. Eliceiri, "Scijava ops: an improved algorithms framework for fiji and beyond", Frontiers in Bioinformatics **Volume 4 - 2024**, 10.3389/fbinf.2024.1435733 (2024).

G. Selzer, C. Rueden, M. Hiner, E. Evans, K. Harrington, and K. Eliceiri, "Napari-imagej: imagej ecosystem access from napari", Nature Methods **20**, 1443–1444 (2023).

N. A. Gahm, C. T. Rueden, E. L. Evans III, G. Selzer, M. C. Hiner, J. V. Chacko, D. Gao, N. M. Sherer, and K. W. Eliceiri, "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

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