

## EMMA MUNCH

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### Education

B.S. in Computer Science in progress, Expected Graduation: May 2021, GPA: 3.88/4.00

University of Southern California. Los Angeles, CA

### Skills

**Languages:** Python, C/C++, Java, HTML/CSS, JavaScript

**Environment:** Linux CLI, Git, Miniconda, Docker

**Databases:** MongoDB Atlas, GCP SQL, Amazon RDS, MS SQL

**Libraries:** NumPy, Pandas, Matplotlib, Jupyter Notebook/Jupyter, Tensorflow, Keras, Seaborn, OpenCV, sklearn, React

**Other:** Tableau, Excel, Adobe Illustrator, Adobe Lightroom

### Experience

#### Ionpath, Inc., Menlo Park, CA

*Data Science Intern—January 2020–February 2020, July 2020–August 2020, December 2020–January 2021*

- Trained and tested U-net convolutional neural network model on multichannel TIFF inputs to create pixel-wise cell type classifications
- Implemented full-stack plot generation pipeline for analysis of cell classification metrics, the results of which are presented to stakeholders of research services products
- Created functions and fixed bugs in the open-source code base for reading and writing TIFF images and contributed to design decisions on the main multiplexed ion-beam image data-structure used throughout the code base

#### USC Image Processing and Informatics Lab, Los Angeles, CA

*Undergraduate Research Fellow—March 2019–present*

- Used image processing techniques (Kirsch kernel and morphological operations) and machine learning (U-net with pretrained VGG16 Encoder) to segment features of retinal images for disease diagnosis and monitoring
- Developed an algorithm for robust blood vessel segmentation in retinal images for improved preprocessing
- Improving code base to include better object-oriented design and consistency with traditional machine learning workflows
- Overseeing underclassman in the lab by delegating tasks, reviewing code, and serving as mentor

#### Bruker Nano Surfaces, San Jose, CA

*Engineering Intern—May 2018–July 2018*

- Performed test matrix on different parameters in algorithm on new focus variation microscope
- Built and populated the HTML online help pages for Focus Variation product in MadCap Flare, while applying knowledge of the difference between focus variation and white light interferometry
- Designed icons for imaging software in Adobe Illustrator and helped review new instrument control UI

### Other Relevant Projects

**Greenmap:** Node.js, Express, React, REST API, MongoDB Atlas, Google Maps API

**Pacman route planning (in progress):** search algorithms, heuristic design

**Xv6 (in progress):** OS design, system calls

**Course Scheduler (in progress):** RDS design, Adobe ColdFusion, Docker

### Activities

**USC Corpus Callosum:** club that strives to bridge arts and technology, created music visualizer in p5.js

**USC Women's Club Volleyball:** Club President 2020-2021, Captain 2018-2021

**USC Healthcare Technology and Analytics:** club that hosts bioinformatics workshops and speaker series

**Tau Beta Pi Honor Society:** Invited to join due to academic excellence within the USC Viterbi School of Engineering

**Interests:** bioinformatics, machine learning, image processing, data analytics/visualization