

# JOHN GIBSON

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New York, NY

jgibson2

## EXPERIENCE

### Senior Computer Vision Engineer / AR Platform Engineering Intern Niantic, Inc.

Jan. 2021 – Present / 2019, 2020 New York, NY

- Contributed to research on state-of-the-art depth estimation networks (SimpleRecon), which is cited 20 times and has >1K stars on GitHub. Retrained network on proprietary dataset of 10,000 scenes and optimized it for on-line inference, achieving an additional 40% speedup.
- Integrated trained SimpleRecon network into production computer vision pipeline for 3D mesh creation, which improved chamfer distance by 18% and F-score by 29%. The pipeline has been used to generate meshes for >100K real-world locations, which are used for remote content authoring, SLAM tracking through 8th Wall WebXR engine, and game physics.
- Implemented, trained, and deployed efficient neural networks for regressing data quality and video anonymization, saving the company approximately \$2 million per year and improving precision by over 80% while preserving recall.
- Implemented multiple heuristics for sequence selection when generating large-scale meshes, reducing GPU compute time by approximately 60%.
- Established and led biweekly reading group, keeping team members updated on the latest advancements in computer vision and deep learning literature.
- Designed and implemented prototype location and visual data query system using finetuned CLIP and Detectron2, enabling discovery of interesting locations from user-collected data using plain text descriptions and object categories.
- Developed high-performance, highly parallelized systems in C++ using the actor model for low-latency distributed SLAM algorithms.

### Teaching Assistant / Student Researcher

#### Washington University in St. Louis

Jan 2018 – Jan 2021 St. Louis, MO

- Worked as head teaching assistant for Analysis of Algorithms, Algorithms for Biosequence Comparison, and Bayesian Optimization and as a teaching assistant for Intro to Engineering Design.
- Used nonlinear optimization and genetic algorithms for estimating the parameters of a thermodynamic model of gene expression in transcription-factor deletion yeast strains.

### Software Engineering Intern

#### CiBO Technologies

May 2018 – Aug 2018 Boston, MA

- Developed cloud-based system for standardized bioinformatics analysis of next-generation sequencing data.
- Maintained and developed genetic information retrieval service for large genomic datasets and organism data for bespoke research needs.

## SELECTED PROJECTS

- Implemented [Instant Neural Graphics Primitives in PyTorch Lightning, SimCLR and NNCLR for image and video contrastive learning, image-to-mesh style transfer using differentiable rendering](#), and denoising diffusion models for face generation.
- Created Bayesian optimization toolkits in [Javascript](#), [JAX](#), and [Julia](#) with multiple kernels and acquisition functions, Bayesian single nucleotide polymorphism detector using 1000 Genomes prior mutation data, and [web-based comparison](#) between methods for predicting Bayesian uncertainty in neural network posteriors.
- Implemented [AR protein viewer](#) using 8th Wall AR engine with three.js and [web-based procedural generation demo](#) using Rust compiled into WASM.
- Led implementation team for an [SMS-based platform](#) to help hospitals handle the COVID patient influx by remotely connecting users to healthcare providers for triage. This project was featured by the Local Hack Day: Share, HackAtHome, and COVID-19 Global Hackathon 1.0 competitions.

## ABOUT ME

Hi! I'm a software engineer who is passionate about building products and research projects that make the world a better place. My interests include computer vision, bioinformatics, deep learning, Bayesian methods, augmented reality, 3D reconstruction, genetics, and medical imaging. Outside of work, I am an avid photographer, hiker, coffee and tea enthusiast, and word game player.

## EDUCATION

### B.S. + M.S. Computer Science

#### Washington University in St. Louis

Aug. 2016 – Jan. 2021 GPA: 3.98

- Graduate Certificate in Data Mining & Machine Learning
- Minor in Bioinformatics

## TECHNOLOGIES

Python C++ Go Javascript

Scala Rust Java

PyTorch Torchvision Numpy JAX

scikit-learn OpenCV Eigen

Docker Kubernetes Git Linux

SQL Google Cloud Platform

Amazon Web Services CMake Bazel

HTTP APIs

## PUBLICATIONS

### SimpleRecon: 3D Reconstruction Without 3D Convolutions

Mohamed Sayed, John Gibson, Jaime Watson, Victor Adrian Prisacariu, Michael Firman, Clément Godard

ECCV, 2022

Prevalence and genetic variants of G6PD deficiency among two Malagasy populations living in Plasmodium vivax-endemic areas

Rosalind E Howes, Ernest R Chan, Tovonahary Angelo Rakotomanga, Seth Schulte, John Gibson, Melinda Zikursh, Thierry Franchard, Brune Ramiranirina, Arsène Ratsimbasoa, Peter A Zimmerman

Malaria Journal, 2017