

ZIWEN CHEN

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RESEARCH INTERESTS

- Computer Vision, Robotics, Artificial Intelligence
- "Anytime" vision models, visual-linguistics, 3D reconstruction, attribute disentanglement, visual retrieval.

EDUCATION

- **Oregon State University**, 2020 - 2025 (Expected), GPA: 3.9/4.0
Ph.D., Computer Science, Awards: *Provost Scholarship, EECS Progression Scholarship*
- **Grinnell College**, 2016 - 2020, GPA: 3.9/4.0
B.A., Mathematics, Computer Science (*with honors*), Honors: *Phi Beta Kappa Member*

TECHNICAL SKILLS

Languages Python, C/C++, Swift, Javascript, HTML/CSS, Ruby, Scheme, Bash, SQL, JAVA, R, MATLAB, Prolog
AI/ML/CV PyTorch, Numpy, OpenCV, OpenGL, NLTK, Cairo, TensorFlow, Scikit-learn, Matplotlib, Pandas
App Development Flask, Xcode, Node.js, React.js, Rails, Apache, jQuery, Google Cloud, SQL, MongoDB, Docker
General Vim, Git, Linux/Unix

RESEARCH EXPERIENCE

ZbuffDepth: Self-supervised Monocular Depth Prediction with Z-buffer **Jerod Weinman's Lab, Grinnell College**
 Publication: [1]. Code: [Q:arthurhero/ZbuffDepth](#) *Feb 2020 to Aug 2020*

- Pinpointed and solved the point-occlusion issue and the negative-depth issue lying in the current self-supervised depth learning paradigm, especially, devised an efficient z-buffering algorithm that correctly and efficiently handles occluded points
- Showed on KITTI that our z-buffer and negative-depth loss both improve the performance of a SOTA depth-prediction network

PC-IGOS: Explaining Point Cloud Classifiers **Deep Machine Vision Lab, Oregon State University**
 Publication: [2]. Code: [Q:arthurhero/PC-IGOS](#) *May 2019 to Sep 2019*

- Invented the first optimization-based visualization technique for finding the minimal saliency map on 3D point clouds
- Invented a curvature smoothing algorithm capable of morphing out curvatures in point clouds, making above technique possible
- Achieved better results in both "deletion" and "insertion" metrics on ShapeNet40 dataset compared to SOTA

Training Data Curator For Text Recognizer **Jerod Weinman's Lab, Grinnell College**
 Publication: [3]. Code: [Q:arthurhero/MapTextSynthesizer](#) *Jun 2018 to Aug 2018*

- Devised a synthetic historical map image generator (>100Hz) in C++ using Cairo graphics library for training a map text recognizer
- Reduced word error by >22% compared SOTA by successfully preventing the text recognizer from overfitting

SceneSlicer: Scene Photo Layer Separator **Personal Fun**
 Code: [Q:arthurhero/SceneSlicer](#) *Mar 2019 to May 2019*

- Designed an algorithm to separate a single scene image into different layers of front-ground objects and the background
- Wrote and trained a Mask-RCNN to segment front-ground objects, and a hole-inpainting GAN to restore occluded background

SOFTWARE ENGINEERING EXPERIENCE

Director of Grinnell AppDev Club **Grinnell AppDev Club**
 Code: [Q:GrinnellAppDev](#) *Sep 2017 to May 2020*

- Led a team of 10+ students and published 4 iOS apps in 3 years for the college community
- Guided team members to develop iOS apps using **Swift** and **Objective-C** in **Xcode**
- Guided team members to write back-end web services (RESTful API) in **Node.js**, **Rails**, **Flask**, etc., utilizing **Docker** and **Apache**

Mayflower Dining **Mayflower Community**
 Code: [Q:CSC322-Grinnell/mayflower-dining](#) *Feb 2020 to May 2020*

- Developed a web app for the dining service of a local senior community using **Ruby on Rails**
- Designed and implemented the back-end data-tracking for menus, dishes, etc. using **PostgreSQL** and wrote tests using **Minitest**

App Gadfly for Facilitating Political Participation **Project Gadfly**
 Code: [Q:ProjectGadfly](#) *Mar 2017 to June 2017*

- Developed an app that helps people to find and call their own representatives and to share the call scripts on social media
- Implemented the back-end using **Flask** and **MySQL** that collects legislators' information and people's call scripts
- Developed the front-end iOS app in **Objective-C** with functionalities like address auto-completion, QR code scanning, etc.

Omnitec Inc. Summer Intern **St. Louis, Missouri**
June 2017 to July 2017

- Developed a cyber-security product for protecting legacy operating systems using **Raspberry Pi**
- Designed the gadget to record the packets passing through using **tcpdump** and to set blocking rules using **iptables**
- Conducted penetration-tests on legacy OSes using **OpenVAS** and **Metasploit**, improving security score from 0% to 97%

PUBLICATIONS

- [1] **Ziwen Chen**, Zixuan Guo and Jerod Weinman. "Improved Point Transformation Methods For Self-Supervised Depth Prediction". In: *18th Conference on Robots and Vision*. February, 2021. (Under Review)
- [2] **Ziwen Chen**, Wenxuan Wu, Zhongang Qi and Fuxin Li. "Visualizing point cloud classifiers by curvature smoothing". In: *The British Machine Vision Conference (BMVC)*. September, 2020.
- [3] Jerod Weinman, **Ziwen Chen**, Ben Gafford, Nathan Gifford, Abyaya Lamsal and Liam Niehus-Staab. "Deep Neural Networks for Text Detection and Recognition in Historical Maps". In: *International Conference on Document Analysis and Recognition (ICDAR)*. September, 2019.

TALKS

- [1] "A firewall that modifies incoming packets". In: *The Missouri, Iowa, Nebraska, and Kansas Women in Computing (MINK WIC) Conference Lightning Talk*. October, 2017.

TEACHING AND MENTORING EXPERIENCE

Grinnell College

- iOS Development - Fall 2017 to Spring 2020 (AppDev Club iOS Lead)
- CSC 341: Automata, Formal Languages, and Computational Complexity - Spring 2019, Fall 2019 (TA)

COURSEWORK HIGHLIGHT

Oregon State University Functional Analysis, Convex Optimization, Matrix Analysis, NLP

Grinnell College Information Retrieval, Sensation and Perception, Electronics, Geometric Analysis, Game Theory, Neuroscience

Online Open Course / Self-taught Quantum Computing, Topology & Geometry, SLAM, Computer Graphics, Knowledge Representation, Linguistics

HONORS AND AWARDS

- *EECS Progression Scholarship*, Oregon State University, 2020
- *Provost Scholarship*, Oregon State University, 2020
- *Phi Beta Kappa Member*, Grinnell College, 2020
- *Grace Hopper Conference Student Scholarship*, 2018
- *Fifth Rank in North Central America Regional of ACM-ICPC*, 2017

OTHER SKILLS

Natural Languages English, Mandarin, Japanese, Spanish, Korean

Sign Languages American Sign Language