

HAOMIN CHEN

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SUMMARY

Johns Hopkins Computer Science PhD candidate with a background of deep learning in medical imaging, interpretable AI systems with human interaction and object segmentation and information extraction in gigapixel-level images. Excellent communication skills and ability to work on teams. Interested in and willing to work on any Computer Vision fields.

EDUCATIONS

Johns Hopkins University

Jan 2018 - Dec 2022 (expected)

Doctor of Philosophy, Computer Science

Baltimore, MD, USA

Advisors: Dr. Mathias Unberath, Dr. Gregory Hager

First author publications: 5 conference papers, 2 journal papers, 2 journal papers under review

First author of one Nature partner journal paper

Columbia University

Sep 2016 - Dec 2017

Master of Arts, Statistics

New York City, NY, USA

Overall GPA: 4.1 / 4.0

Fudan University

Sep 2012 - Jun 2016

Bachelor of Science, Physics

Shanghai, CHINA

Core GPA: 3.6 / 4.0

SKILLS

Python, C++, Linux, Slurm, Docker, PyTorch, Tensorflow, Matlab, R

INTERNSHIPS

Meta, Redmond

June 2022 - Aug 2022

Research Intern

Redmond, WA, USA

3D scene style transfer with 2D style image by differential rendering

- Internship performance exceeds director/mentor/peers' expectation in review.
- Learned style transfer, 3D mesh and rendering from scratch in one week.
- Utilized PyTorch3D & nvdiffrast as differential rendering to generate 2D views.
- Optimized texture maps by style transfer between 2D rendered images and style image.
- Preserved object style consistency by semantic style transfer.

NVIDIA, Bethesda

May 2018 - Dec 2018

Applied Research Intern

Bethesda, MD, USA

Deep Hierarchical Multi-label Classification of Abnormalities in Chest X-rays

- Paper accepted by MIDL 2019 with oral presentation.
- Special invitation to Journal "Medical Image Analysis" and paper accepted.
- Followed clinical taxonomy to construct hierarchical multi-label classification.
- Fit the extreme label imbalance dataset by a two-stage training procedure.
- Derived a numerically stable math formulation to avoid floating point underflow calculating loss.

PingAn Technology, Bethesda

Applied Research Intern

May 2019 - Dec 2019

Bethesda, MD, USA

Anatomical symmetric learning for Fracture Detection in Pelvic Trauma X-ray

- Paper accepted by ECCV 2020 with poster presentation.
- Mimicked radiologists' practice by comparing vertical asymmetric areas via Siamese network.
- Aligned Siamese features according to GNN-detected pelvic structure landmarks.
- Learned anatomical asymmetry explicitly by novel pixel-wise contrastive loss.

PingAn Technology, Shanghai

Data Mining Scientist Intern

May 2017 - Aug 2017

Shanghai, CHINA

Lung nodule detection in CT scans

- Top 6 out of 2887 teams in the Skylake competition sponsored by Intel and Alibaba.
- Applied PyTorch, 3D UNet and Caffe, Faster RCNN to detect lung nodules in 1000 CT scans.
- Used fusion method to reduce false positives.

SELECTED PUBLICATIONS

Journal papers:

1. **Haomin Chen***, Catalina Gomez*, Chien-Ming Huang, Mathias Unberath. Explainable Medical Imaging AI Needs Human-Centered Design: Guidelines and Evidence from a Systematic Review. **npj Digital Medicine (IF=11.65)** 5, 156 (2022).
2. **Haomin Chen**, Shun Miao, Daguang Xu, Gregory Hager, Adam Harrison. Deep hierarchical multi-label classification applied to chest X-ray abnormality taxonomies. (2020) **Medical Image Analysis (IF=13.82)** 66, 101811.
3. T. Y. Alvin Liu*, **Haomin Chen***, Catalina Gomez, Zelia Correa, Mathias Unberath. Direct Gene Expression Profile Prediction for Uveal Melanoma from Digital Cytopathology Images via Deep Learning and Salient Image Region Identification. **Ophthalmology Science (IF=7.18)**.
4. David Dreizin, Bryan Nixon, Jiazhen Hu, Benjamin Albert, Chang Yan, Gary Yang, **Haomin Chen**, Yuanyuan Liang, Nahye Kim, Jean Jeudy, Guang Li, Elana B. Smith, Mathias Unberath. A pilot study of deep learning-based CT volumetry for traumatic hemothorax. (2022) **Emergency Radiology (IF=1.59)** DOI:10.1007/s10140-022-02087-5.

Conference papers:

1. **Haomin Chen***, Yirui Wang*, Kang Zheng, Weijian Li, Chi-Tung Chang, Adam P. Harrison, Jing Xiao, Gregory D. Hager, Le Lu, Chien-Hung Liao, Shun Miao. Anatomy-aware siamese network: Exploiting semantic asymmetry for accurate pelvic fracture detection in x-ray images. **ECCV 2020**.
2. **Haomin Chen**, Shun Miao, Daguang Xu, Gregory D. Hager, Adam P. Harrison. Deep hierarchical multi-label classification of chest X-ray images. **MIDL 2019**.
3. **Haomin Chen**, T. Y. Alvin Liu, Catalina, Gomez, Mathias Unberath. An Interpretable Algorithm for Uveal Melanoma Subtyping from Whole Slide Cytology Images. **IMLH**, 2021. (*ICML workshop*).
4. **Haomin Chen**, T. Y. Alvin Liu, Zelia M. Correa, Mathias Unberath. An Interactive Approach to Region of Interest Selection in Cytologic Analysis of Uveal Melanoma Based on Unsupervised Clustering. **OMIA**, 2020 (*MICCAI workshop*).

5. David Dreizin, **Haomin Chen**, Alexander Upegui, Guang Li, Mathias Unberath. Blunt splenic trauma: accuracy of automated active bleed and contained vascular injury detection on CT with Faster R-CNN. **ASER** 2022 and **RSNA** 2022.
6. David Dreizin, **Haomin Chen**, Alexander Upegui, Guang Li, Mathias Unberath. Blunt splenic trauma: automated splenic parenchymal disruption volumes for decision making in patients with no vascular injuries on CT. **ASER** 2022 and **RSNA** 2022.
7. Yifan Gao*, **Haomin Chen***, Catalina Gomez*, Sophie Cai, Craig K. Jones, Adrienne Scott, Mathias Unberath. An Interpretable Approach to Identifying Sea Fan Neovascularization in Ultra-Widefield Color Fundus Photographs of Patients With Sickle Cell Hemoglobinopathy. **SPIE**, 2021.
8. T. Y. Alvin Liu, Hongxi Zhu, **Haomin Chen**, J. Fernando Arevalo, Ferdinand K. Hui, Paul H. Yi, Jinchi Wei, Mathias Unberath, Zelia M. Correa. Gene Expression Profile Prediction in Uveal Melanoma Using Deep Learning: A Pilot Study for the Development of an Alternative Survival Prediction Tool. **Ophthalmology Retina**, 2020.

PREPRINTS & IN SUBMISSION

The * indicates an equal contribution.

1. **Haomin Chen**, David Dreizin, Mathias Unberath. Automated interpretable AAST Grading for Blunt Splenic Injury. **Radiology AI (IF=22.5)** *under review*.

AWARDS

National College Students Mathematics Competition, National Silver Medal.	<i>Oct 2013</i>
National College Students Mathematics Model Contest, the third prize of Shanghai.	<i>Oct 2014</i>
Second-class scholarship of Fudan University.	<i>May 2015</i>
Mensa Member in China.	<i>May 2016</i>