

# HAOMIN CHEN

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## SUMMARY

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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.

## EDUCATIONS

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### Johns Hopkins University

Doctor of Philosophy, Computer Science

Advisors: Dr. Mathias Unberath, Dr. Gregory Hager

First author publications: 5 conference papers, 1 journal paper, 3 journal papers under review

**Jan 2018 - Dec 2022 (expected)**

*Baltimore, MD, USA*

### Columbia University

Master of Arts, Statistics

Overall GPA: 4.1 / 4.0

**Sep 2016 - Dec 2017**

*New York City, NY, USA*

### Fudan University

Bachelor of Science, Physics

Core GPA: 3.6 / 4.0

**Sep 2012 - Jun 2016**

*Shanghai, CHINA*

## SKILLS

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

## INTERNSHIPS

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### Meta, Redmond

*Research Intern*

**June 2022 - Aug 2022**

*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

*Applied Research Intern*

**May 2018 - Dec 2018**

*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, 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

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The \* indicates an equal contribution. Full publications in [Google scholar](#).

Journal papers:

1. **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.

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

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The \* indicates an equal contribution.

1. **Haomin Chen\***, Catalina Gomez\*, Chien-Ming Huang, Mathias Unberath. INTRPRT: A Systematic Review of and Guidelines for Designing and Validating Transparent AI in Medical Image Analysis. **npj Digital Medicine (IF=11.65)** *under second-round review*.
2. **Haomin Chen**, David Dreizin, Mathias Unberath. Automated interpretable AAST Grading for Blunt Splenic Injury. **Radiology AI (IF=22.5)** *under review*.
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 Retina (IF=8.5)** *under second-round review*.

## AWARDS

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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>