

HAOMIN CHEN

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INTEREST

Medical Image Analysis, Transparent system, Computer Vision, and Machine Learning

EDUCATIONS

Johns Hopkins University

Doctor of Philosophy, Computer Science

Advisor: Dr. Mathias Unberath, Dr. Gregory Hager

First author publications: 4 conference papers, 1 journal paper

Baltimore, MD, USA

Jan 2018 - Dec 2022 (expected)

Columbia University

Master of Arts, Statistics

Overall GPA: 4.1 / 4.0

New York City, NY, USA

Sep 2016 - Dec 2017

Fudan University

Bachelor of Science, Physics

Core GPA: 3.6 / 4.0

Shanghai, CHINA

Sep 2012 - Jun 2016

INTERNSHIPS

PingAn, Bethesda

Applied Research Intern

May 2019 - Dec 2019

Bethesda, MD, USA

Symmetric learning for Fracture Detection in Pelvic Trauma X-ray

- Accepted by ECCV with poster.
- Achieved 98.8% AUC for all fractures, which is 0.8% higher than baseline model.
- Created alignment between original/flipped images according to pelvic structure landmark detection.
- Constructed Siamese network with fusion layer to incorporate symmetric information.
- Aligned Siamese features instead of input images to reduce distortion artifacts.
- Applied pixel-wise contrastive loss to learn pathologically asymmetric information explicitly.

NVIDIA, Bethesda

Applied Research Intern

May 2018 - Dec 2018

Bethesda, MD, USA

Deep Hierarchical Multi-label Classification of Chest X-ray

- Accepted by MIDL 2019 with oral and special invitation to Journal “Medical Image Analysis”.
- Achieved 89% AUC of all diseases on PLCO dataset, which is the state of the art.
- Constructed Hierarchical label structure following clinical taxonomy.
- Trained with conditional probabilities first and then fine-tuned with full probabilities training.
- Derived a numerically stable formulation to calculate the cross entropy loss using full probabilities.
- Introduced conditional AUCs for hierarchical-label performance evaluation.

PingAn Technology, Shanghai

Data Mining Scientist

May 2017 - Aug 2017

Shanghai, CHINA

Lung nodule detection in CT images

- Achieved rank 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.

- Truncated the last two deconvolution layers in U Net changed the output as RPN structure and added new output branches before every deconvolution layer.
- Used fusion method to achieve false positive reduction.

ACADEMIC ACTIVITIES

Invited reviewer for the following conferences:

Conferences: MICCAI (2020), MIDL (2019, 2020)

PREPRINTS

The * indicates an equal contribution.

1. 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. In submission.

SELECTED PUBLICATIONS

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

1. **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*)
2. **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*)
3. **Haomin Chen**, Shun Miao, Daguang Xu, Gregory Hager, Adam Harrison. Deep hierarchical multi-label classification applied to chest X-ray abnormality taxonomies. **Medical Image Analysis** 66, 101811.
4. 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.
5. **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.
6. **Haomin Chen**, Shun Miao, Daguang Xu, Gregory D. Hager, Adam P. Harrison. Deep hierarchical multi-label classification of chest X-ray images. **MIDL** 2019.

AWARDS

1. National College Students Mathematics Competition, National Silver Medal. Oct 2013

SKILLS

Python, Matlab