HAOMIN CHEN

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INTEREST

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

EDUCATIONS

Johns Hopkins University   **Baltimore, MD, USA**
Doctor of Philosophy, Computer Science   *Jan 2018 - Dec 2022 (expected)*
Advisor: Dr. Mathias Unberath, Dr. Gregory Hager
First author publications: 4 conference papers, 1 journal paper

Columbia University   **New York City, NY, USA**
Master of Arts, Statistics   *Sep 2016 - Dec 2017*
Overall GPA: 4.1 / 4.0

Fudan University   **Shanghai, CHINA**
Bachelor of Science, Physics   *Sep 2012 - Jun 2016*
Core GPA: 3.6 / 4.0

INTERNSHIPS

PingAn, Bethesda   May 2019 - Dec 2019
Applied Research Intern   *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   May 2018 - Dec 2018
Applied Research Intern   *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   May 2017 - Aug 2017
Data Mining Scientist Intern   *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. ***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. In submission.

2. 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, PyTorch, Tensorflow, C++, Matlab, R