KEXIN DING

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Actively looking for 2022 summer intern in computer vision, deep learning and machine learning related positions

EDUCATION

University of North Carolina at Charlotte   **Charlotte, NC**
Ph.D. student in Computer Science. GPA: 3.714/4.0   *09/2019 – Expected 2023*

- Advisor(s): Dr. Shaoting Zhang and Dr. Aidong Lu
- Research area: deep learning, machine learning, computer vision, medical image analysis.

Lehigh University   **Bethlehem, PA**
M.S. in Computer Science   *09/2017 - 05/2019*

- Coursework: Algorithm and data structure, Machine learning, deep learning, data mining.

Xidian University   **Xi'an, China**
B.S. in Intelligent Science Technology   *09/2013 - 06/2017*

WORK & RESEARCH EXPERIENCE

SenseTime (Leading AI start-up company in Asia) *Research intern*   **Beijing, China**, *06/2019-09/2019*

- Implemented CNN models for gene mutation prediction using pathological images in colon cancer by **PyTorch**.
- Trained a tumor detection model to select the tumor region patches (e.g.,**10k**) for gene mutation prediction.
- Implemented an image preprocessing pipeline including segmentation, foreground detection, and normalization.

Spatially-aware Graph Neural Networks Enable Cross-level Molecular Profile Prediction in Colon Cancer

- Achieved **5%-15%** prediction improvements (AUC) compared with other state-of-the-art studies.
- Implemented a GNN model for predicting a panel of molecular profiles in colon cancer using **PyTorch** while developed an image-graph transformation strategy to define the spatially-connected graph.
- Designed a tile importance interpretation method to select clinical-relevance tiles for outcome explanation.

Graph Neural Networks for COVID-19 Diagnosis Based on Computed Tomography Images

- Implemented an agile transfer learning framework of GNN while using graph-wised data augmentation strategy to improve the efficiency and diagnosis accuracy of COVID-19 patients by using **PyTorch**.
- Introduced a KNN-graph construction strategy that covert CT images to graph structure data.

Feature-enhanced Graph Neural Networks for Genetic Mutational Prediction on colon cancer

- Achieved **15%-20%** genetic mutation prediction improvement(AUC) compare with CNN baseline models.
- Designed a GNN model to improve the ability of distinguishing non-isomorphic graphs while exploring both image and topological features using **PyTorch**.
- Utilized a subgraph ensemble strategy to alleviate cancer heterogeneity and boost the prediction performance.

PUBLICATION

[1] **Kexin Ding**, Qiao Liu, Edward Lee, Mu Zhou, Aidong Lu, and Shaoting Zhang, "Feature-Enhanced Graph Networks for Genetic Mutational Prediction Using Histopathological Images in Colon Cancer.", *In International Conference on Medical Image Computing and Computer-Assisted Intervention (MICCAI2020), pp. 294-304. Springer, Cham, 2020*. **Accepted by MICCAI2020**.

[2] Spatially-aware Graph Neural Networks Enable Cross-level Molecular Profile Prediction in Colon Cancer Histopathology: A Retrospective Multicentre Cohort Study. *Submitted to The LANCET Digital Health*.

[3] Graph Convolutional Networks in Multi-modality Medical Imaging: Concepts, Architectures, and Clinical Applications. *Under preparation*.

PROFESSIONAL SKILLS

Programming languages: Python, Matlab, SQL, Java, Javascript, C, Scala   **Operation system**: Linux, MacOS
Framework: PyTorch, NumPy, Matplotlib, Slearn, Pandas, Pillow, CUDA   **Language**: English, Mandarin