LUO HAOZHE

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SUMMARY

- GPA: 3.83/4.0 (90.08/100) Bachelor
- Language score: IELTS 7
- Interdisciplinary undergraduate with skills and experience in machine learning, cognitive neuroscience, and Algorithmic intelligence
- Self-motivated, problem-solving and collaborative undergraduate with excellent communication skills

TECHNICAL SKILLS

- **Data Science** Data cleaning, Data processing, Data analysis
- **Computer Vision and NLP** Image segmentation, Target detection, Image classification, Self-supervised Learning, NAS, NLP
- **Programming languages** C++, Python,R

RESEARCH EXPERIENCE

- **Research leader, Supervised by Prof. Hu Long and Prof.Wanzhong Song December 2019 - June 2020**
- **CBCT tooth segmentation using enhanced UNet with intensive contextual interaction and self-attention gate layers.**
  - Requested and collected CBCT tooth images of one hundred patients and have labeled and used some them to build a tooth semantic segmentation data set
  - Design attention gate layers which contains contextual semantic interaction and spatialchannel wise attention mechanism for tooth segmentation task,reaching sota performance compared to other baselines
  - 3D reconstruction of the segmentation results to solve the problem of not being able to see the internal root of the tooth in 3D point cloud segmentation

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- **Research Member, Supervised by Prof. Wen Liao and Prof. Wanzhong Song October 2020 - May 2021**
- **Two-stage network for detection and grading of tooth resorption**
  - Requested and collected Orthopantomogram images of more than a thousand of patients and have labeled and used them to build a data set
  - In order to solve the problem that the traditional target detection + classification all-in-one approach is ineffective (Faster-RCNN, RetinaNet) Our cascade network first locates and extracts teeth with the first stage target detection network, and then feeds into the fine-grained classification network for high-precision classification
  - Use size-maintaining padding+resize instead of resize to fix the input size, use the AHE algorithm to improve image quality (metal artifacts), and scale resampling to solve the long-tail distribution of the dataset

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- **Research Member, Collaborated with Dr. Changdong Yu (Harbin Engineering University) March 2021 - June 2021**
- **A cascaded convolutional neural network for Two-phase Flow Particle Image Velocimetry**
  - Propose an ultra-lightweight semantic segmentation network is proposed that is able to infer at high FPS and achieve slightly higher results than previous work in the field of a liquid phase extraction from two-phase flow PIV images
  - convolutional cascade network is constructed, the liquid phase is extracted and the original image is masked by semantic segmentation network, and then the optical flow estimation network (RAFT) is applied to velocimetry of the image pairs, which achieves fully automatic and high accuracy, and solves the problem of the feature pairs appearing in it with a simple idea.
  - Constructed an ultra-large synthetic dataset for pre-training and finetune on real data, achieving excellent results

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- **Research assistant, Supervised by Dr. Charles Li(Stanford University) and Dr.Chen Wang(UCLA,IBM) January 2021 - September 2021**
- **Human Machine Interaction: From Interactive Computer Graphics to Brain Machine Interfaces**
  - Reviewing the history of human-computer interaction systems and building virtual social environments based on their consistency
  - Read and summarize a large number of articles in related fields and conduct many basic experiments

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- **Summer research internship, Supervised by prof.Raghavendra Selvan(University of Copenhagen) June 2021 - January 2022**
- **Hybrid Ladder Transformers with Efficient Parallel-Cross Attention for Medical Image Segmentation**

  - Using learnable attentional feature vectors as global supervised information and interacting with convolutional paths layer by layer, the number and quality of features are maintained while keeping the computational effort small
  - Overcome the problem that pure visual transformer is difficult to train on small-scale datasets, and achieve sota results on two small-scale medical segmentation public datasets
- **Research internship(online visiting scholar), Supervised by prof.Jianming Liang (Arizona State University) February 2022 - April 2023**
- **Self Supervised Learning of transformer in medical images**
  - Exploring the migratability of the transformer family of models in medical images, including a comparison of performance from scratch training and fine-tuning, and model migration performance from imagenet22k pre-training.
  - Designing of stable and effective self-supervised algorithms for downstream tasks based on the similarity between medical images and the universality of semantic regions

PUBLICATIONS

- 28/02/2022, Hybrid Ladder Transformers with Efficient Parallel-Cross Attention for Medical Image Segmentation (Accepted to be presented at the 5th International Conference on Medical Imaging with Deep Learning (MIDL))
- 16/11/2021, A Cascaded Convolutional Neural Network for Two-phase Flow PIV of An Object Entering Water, IEEE Transactions on Instrumentation and Measurement
- 01/10/2021, An Effective Convolutional Neural Network for Liquid Phase Extraction in Two-Phase Flow Piv Experiment of An Object Entering Water, Ocean Engineering
- 17/05/2021, Machine Learning in Dental, Oral and Craniofacial Imaging: a Review Of Recent Progress, PeerJ
- Auxiliary diagnosis and grading of root resorption using deep learning(submitted to JDR(Journal of Dental Research))
- Patent: Dental Body detection model, generation method, and dental body segmentation method.
- Software Copyright: Deep learning-based automatic root resorption localization and grading system

EDUCATION

- Bachelor, Computer Science And Technology, SiChuan University(985 project), 2022
- Master Candidate, Artificial Intelligence, University of Zurich, 2022

WORK EXPERIENCE

- Position: Artificial Intelligence Algorithm Intern November 2021 - April 2022
- Company: SenseTime;18th floor, building B6,zone D, tianfu jingrong center, no.99 west hupan road, tianfu new district, chengdu; https://www.sensetime.com/
- Work content: Research of Neural Architecture Search(focus on Transformer architecture), AutoML

AWARDS

- 15/11/2020, 2020 College Students' Innovative Entrepreneurial Training Plan Program Provincial level, Ministry of Education of the People's Republic of China
- 12/11/2021, 2021 College Students' Innovative Entrepreneurial Training Plan Program Provincial level Awards, Ministry of Education of the People's Republic of China
- 13/09/2021, 2021 College Students' Innovative Entrepreneurial Training Plan Program National level Awards, Ministry of Education of the People's Republic of China
- 10/09/2020, Individual first-class Scholarship for 2019, Sichuan University
- 15/10/2019, Third prize of 2019 Contemporary Undergraduate Mathematical Contest in Modeling(CUMCM) in Sichuan Province, China Society for Industrial and Applied Mathematics
- 10/09/2021, Individual first-class Scholarship for 2020, Sichuan University
- 10/10/2018, Student of Wu Yuzhang Honors College, Sichuan University, Sichuan University

MEMBERSHIPS

- 10/09/2018, committee member of Department of Science, Technology and Culture, Sichuan University
- 10/03/2020, Founding member and technical backbone of Geek Club, Sichuan University

OTHER SKILLS

Languages English: skilled. Chinese: native. German: conversational.
Musical instrument piano,ukelele.