

HAO YU

<http://cs-people.bu.edu/haoyu/>

Department of Computer Science, Boston University, Boston, MA, 02215

+1-617-372-1630 ◊ haoyu@bu.edu

EDUCATION

Boston University, Boston, MA, USA

Sep 2019 - Present

PhD Candidate in Computer Science

Advisor: Prof. Margrit Betke

GPA: 3.97 / 4.0

Zhejiang University, Hangzhou, Zhejiang, China

Sep 2015 - Jun 2019

B.E. in Computer Science and B.A. in English Language and Literature

GPA: 3.95 / 4.0

RESEARCH EXPERIENCE

Leveraging Affect Transfer Learning for Behavior Prediction in an Intelligent Tutoring System

January 2021 - Present

Supervisor: Prof. Margrit Betke

Graduate researcher at Boston University

- Proposed a video-based transfer learning approach for predicting problem outcomes of students working with an intelligent tutoring system (ITS) by analyzing their faces and gestures.
- Created a large labeled dataset of student interactions with an intelligent online math tutor.
- Our model achieved a 50% relative increase in mean F-score over the previous state-of-the-art method.

Measurements and Interventions to Improve Student Engagement and Affect in Tutoring Systems

September 2020 - September 2021

Supervisor: Prof. Margrit Betke

Graduate researcher at Boston University

- Conducted two studies using computer vision techniques to measure students' engagement and affective states from their head pose and facial expressions, as they use an online tutoring system.
- Presented and integrated engagement strategies into the online tutoring system to help students re-engage once their attention wanders.
- A usability study was conducted and initial results indicate that students exposed to our re-engagement strategies were more confident and more persistent, responding positively to our learning companion.

Facial Emotion Analysis for Videos of Presidential Candidates September 2020 - Present

Supervisor: Prof. Margrit Betke

Graduate researcher at Boston University

- Collected a large video database of YouTube videos and TV news of 2020 US presidential candidates.
- Annotated the videos with emotion labels via crowd sourcing on Amazon Mechanical Turk.
- Proposed a multi-modal system for facial emotion recognition, which uses pretrained ResNet-18 to extract facial features and uses BERT (Bidirectional Encoder Representations from Transformers) to extract text features. A frame attention module was then adopted for video-based recognition.

AWARDS

Best Poster Award (4% award rate), IEEE International Conference on Automatic Face and Gesture Recognition (FG 2021) *2021*

Research and Innovation Scholarship, Zhejiang University *2017-2018*

Scholarship for Outstanding Merits, Zhejiang University *2016-2018*

TEACHING EXPERIENCE

Teaching Fellow, Introduction to Computer Science II (CS 112), Boston University *2020 Spring*
Teaching Fellow, Image and Video Computing (CS 585), Boston University *2021, 2022 Spring*

PROFESSIONAL ACTIVITIES

Reviewer for IEEE Transactions on Pattern Analysis and Machine Intelligence (PAMI) *2019*
Reviewer for IEEE Conference on Computer Vision and Pattern Recognition (CVPR) *2022*
Reviewer for European Conference on Computer Vision (ECCV) *2022*

RELEVANT COURSEWORK

- **Graduate Coursework:** Deep Learning, Machine Learning, Big Data Systems for Data Science, Optimization Theory II, Randomness in Computing.
- **Undergraduate Coursework:** Computer Vision, Computer Graphics, Artificial Intelligence, Information Retrieval, Algorithms.

TECHNICAL SKILLS

Computer Languages	Python, C/C++, Java, MATLAB, L ^A T _E X, JavaScript
DL Frameworks	PyTorch, TensorFlow and TensorFlow.js, Caffe, Keras
Toolkits	OpenCV, Scikit-learn, SciPy, Pandas, Numpy, CUDA, ONNX Runtime

PUBLICATIONS

- [1] Nataniel Ruiz*, **Hao Yu***, Danielle A. Alessio, Mona Jalal, Ajjen Joshi, Tom Murray, John J. Magee, Kevin Manuel Delgado, Vitaly Ablavsky, Stan Sclaroff, Ivon Arroyo, Beverly P. Woolf, Sarah Adel Bargal, and Margrit Betke. "ATL-BP: A Student Engagement Dataset and Model for Affect Transfer Learning for Behavior Prediction." Under Review for IEEE Transactions on Biometrics, Behavior, and Identity Science, 2022.
- [2] Will Lee, Danielle Alessio, William Rebelsky, Sai Satish Gattupalli, **Hao Yu**, Ivon Arroyo, Margrit Betke et al. "Measurements and Interventions to Improve Student Engagement Through Facial Expression Recognition." In International Conference on Human-Computer Interaction, pp. 286-301. Springer, Cham, 2022.
- [3] **Hao Yu**, Ankit Gupta, Will Lee, Ivon Arroyo, Margrit Betke, Danielle Alessio, Tom Murray, John Magee, and Beverly P. Woolf. "Measuring and Integrating Facial Expressions and Head Pose as Indicators of Engagement and Affect in Tutoring Systems." In International Conference on Human-Computer Interaction, pp. 219-233. Springer, Cham, 2021.
- [4] Nataniel Ruiz, **Hao Yu**, Mona Jalal, Danielle Alessio, Ajjen Joshi, Tom Murray, Vitaly Ablavsky, John Magee, Jacob Whitehill, Ivon Arroyo, Beverly Woolf, Stan Sclaroff, Margrit Betke. "Leveraging Affect Transfer Learning for Behavior Prediction in an Intelligent Tutoring System." In 2021 16th IEEE International Conference on Automatic Face and Gesture Recognition (FG 2021), IEEE, 2021.
- [5] Kevin Delgado, Juan Manuel Origgi, Tania Hasanpoor, **Hao Yu**, Danielle Alessio, Ivon Arroyo, William Lee, Margrit Betke, Beverly Woolf, and Sarah Adel Bargal. "Student Engagement Dataset." In Proceedings of the IEEE/CVF International Conference on Computer Vision Workshops (ICCVW 2021), pp. 3628-3636. 2021.
- [6] Krishna Kumar Singh, **Hao Yu**, Aron Sarmasi, Gautam Pradeep, and Yong Jae Lee. "Hide-and-seek: A data augmentation technique for weakly-supervised localization and beyond." arXiv preprint arXiv:1811.02545, 2018.

*Equal contribution