# JIAN SUN

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## EDUCATION

**Ph.D. Candidate in Computer Science** September 2018 -- Present
University of Denver, Denver, CO
**Master of Science in Statistics** May 2017
The George Washington University, Washington, DC
**Bachelor of Science in Mathematics and Applied Mathematics** July 2014
Shandong Agricultural University, Tai'an, China

## RESEARCH INTERESTS

My research emphasizes on Computer Vision, Natural Language Processing, Deep Learning, Data Imbalance, Model Design. The applications in the published papers involve Facial Expression Recognition, Suicide Intention Detection, and Mild Cognitive Impairment.

## RESEARCH EXPERIENCE

**Doctoral Researcher** September 2018 – Present
Department of Computer Science, University of Denver
- Design a new efficient Fully Connected layer XnODR/XnIDR.
- Contribute to detecting Mild Cognitive Impairment by analyzing interview videos.
- Research on referring to video quality during video classification.
- Solve data imbalance issues by creating the loss function or utilizing self-supervised learning.
- Response to writing academic papers and drawing posters.

**Journal and Conference Reviewer** 2020 – Present
- Reviewed papers for the bellowed journals:
  IEEE Transactions on Affective Computing (TAFFC) IEEE Journal of Biomedical & Health Informatics (JBHI)
  Computational Intelligence
- Reviewed papers for the bellowed conferences:
  2025 AAAS Annual Meeting
  2024 IEEE RAS EMBS 10th International Conference on Biomedical Robotics and Biomechatronics (BioRob 2024)
  2020, 2023 IEEE International Conference on Robotics and Automation (ICRA)
  2020, 2023 IEEE International Conference on Automatic Face and Gesture Recognition (FG)

## TEACHING AND MENTORING EXPERIENCE

**Graduate Teaching Assistant** April 2019 – Present
*Department of Computer Science, University of Denver*
- Course: Algorithms for Data Science.
- Guided students on coursework, graded assignments and exams.

*Department of Electrical and Computer Engineering, University of Denver*
- Courses: Machine Learning, Python for Engineers, Intro to Mechatronic Systems I and II, VLSI Design.
- Designed lectures, quizzes, homework, and exams.
- As guest lecturer, taught Transformer models, Graph Neural Networks, and Traditional Machine Learning Algorithms.
- Guided students on coursework, graded assignments and exams.

*Department of Business Information & Analytics, University of Denver*
- Courses: Python Programming, Automating Business Processes, Complex Data Analytics, Predictive Analytics.
- Presented as a guest lecturer on Intro to Machine Learning and Intro to Computer Vision.
- Guided students on coursework.

**STEM Tutor** December 2019 – March 2022
*Learning Effectiveness Program, University of Denver*
- Helped college students with Learning Disabilities, and/or Attention Deficit Hyperactivity Disorder (ADHD), students on the Autism Spectrum, and students who have a history of learning differences to learn better.
- Taught students mathematics, statistics, and computer science courses such as calculus, programming language, algebra, mathematical statistics, etc.

**Student-Athlete Tutor** September 2021 – June 2022
*Division of Athletics & Recreation, University of Denver*
- Taught and helped NCAA Athletes study Business Analytics-related courses from Business School.

## PUBLICATIONS

Sun, J., Dodge, H. H., & Mahoor, M. H. (2024). MC-ViViT: Multi-branch classifier-ViViT to detect mild cognitive impairment in older adults using facial videos. *Expert Systems with Applications, 238*, 121929. https://doi.org/10.1016/j.eswa.2023.121929

Sun, J., Fard, A.P. & Mahoor, M.H. XnODR and XnIDR: Two Accurate and Fast Fully Connected Layers for Convolutional Neural Networks. *J Intell Robot Syst* 109, 17 (2023). https://doi.org/10.1007/s10846-023-01952-w

Lin, E., Sun, J., Chen, H., & Mahoor, M. H. (2024). Data Quality Matters: Suicide Intention Detection on Social Media Posts Using a RoBERTa-CNN Model. *arXiv preprint arXiv:2402.02262*. Accepted by IEEE EMBC 2024.

## CONFERENCE PRESENTATIONS

"Data Quality Matters: Suicide Intention Detection on Social Media Posts Using a RoBERTa-CNN", IEEE EMBC 2024, Orlando, FL, July 15 – 19, 2024

"MC-ViViT: Multi-branch classifier-ViViT to detect mild cognitive impairment in older adults using facial videos", STEM Poster Day at the Capital, Denver, CO, March 13, 2024

"Review of State-of-the-Art Deep Learning Approaches for Visual Object Recognition and Tracking: Applications to Unmanned Aircraft Systems", ICUAS 2023, Warsaw, Poland, June 6 – 9, 2023

## HONORS AND AWARDS

The University of Denver

- GSA Scholarship 2020 - 2024
- Deans Scholarship 2018

2014 American Mathematical Contest in Modeling. 2014

- 3rd Prize

"HEP Cup" China Undergraduate Mathematical Contest in Modeling 2013

- 2nd Prize in Shandong

## PROFESSIONAL EXPERIENCE

**Project Supervisor** June 2023 – January 2024

2023 DU Vision and Robotic Lab Summer Research, Denver, CO

- Guided students to research using the state-of-the-art RoBERTa-CNN model to detect Suicide Intention at the early stage by analyzing Social Media Posts.
- Guided students to clean the sentence-based dataset and write academic paper.
- The paper was accepted by IEEE EMBC 2024

**Software Engineering Intern** June 2022 – August 2022

Dream Face Technologies, LLC, Denver, CO

- Work with developing and training computer vision and deep machine algorithms to analyze audio-visual data of older adults to distinguish Mild Cognitive Impairment and early-stage Alzheimer's disease from healthy controls.
- Collaborate with the engineering team at DFT to analyze video data from the I-CONECT dataset and integrate the model with other systems (Ryan Apps).
- Write a scientific report on the results based on this research.
- Published paper, MC-ViViT: Multi-branch Classifier-ViViT to Detect Mild Cognitive Impairment in Older Adults Using Facial Videos.

**Database Consultant** February 2021 – November 2021

Colorado Municipal Clerks Association, Denver, CO

- Modified and Optimized User Interface and User Experience in MS Access.
- Addressed potential bugs and accelerated the visiting speed of the backend database.

**Computer Vision Engineer Intern** July 2019 – August 2019

Tsinghua University Big Data Laboratory at Qingdao Center, Qingdao, China

- Classified different rats from blurred video and recognized small objects from the picture.
- Used models and functions: Tensorflow, Keras, MobileNet V2, SVM, GrabCut, alpha matte, Poisson Matting, CNN, LibSVM.
- The accuracy of project one is around 0.63.

**Placement Intern, Data Analyst** July 2017 – January 2018

United States Peace Corps, Washington, DC

- Built a prediction model to evaluate qualified candidates, whether they would accept or decline the invitation, reduced the padding rate in the delivery process, and evaluated candidates' language level.
- Used models and functions: R, R Shiny, SQL, Pivot Tables; random forest, weighted linear regression, Naïve Bayes Classifier.

- Prediction Accuracy is 98.37%; R Shiny Data visualization link: http://keepcreation.shinyapps.io/summerize/.

## UNIVERSITY SERVICE

**Student Actor** 2021 – 2022

*Division of Marketing & Communications, University of Denver*

- Joined in filming the University Marketing Video in May 2022.
- Joined the University Television Commercial Shoot in July 2021

## TECHNICAL SKILLS AND CERTIFICATIONS

Programming Languages: **Python, Java, C++, R, SAS, MATLAB, MySQL, Unix/Linux, Tableau, Microsoft Office Suite**
Packages: **TensorFlow, PyTorch, MapReduce, Keras, OpenCV, Spark, HBase**
Certification: **SAS Base Programming for SAS 9; SAS Advanced Programming for SAS 9, Certificate Number: AP020919v9.**
Got 5-star gold level badges for SQL and Python and got a Python (Intermediate) Certificate (14BA6D47EC75) on HackerRank.

## PROFESSIONAL MEMBERSHIPS

- Institute of Electrical and Electronics Engineers (IEEE)
- IEEE Engineering in Medicine and Biology Society (EMBS)
- American Association for the Advancement of Science (AAAS)

## REFERENCES

**Mohammad H. Mahoor**, Professor
Department of Electrical and Computer Engineering
University of Denver
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