Samson Yu Bai Jian

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Education

- **National University of Singapore** — Singapore
  Master of Computing - Artificial Intelligence Specialisation — *2022.08 - Present*
- **Singapore University of Technology and Design** — Singapore
  Bachelor of Engineering - Information Systems Technology and Design — *2017.05 - 2020.09*
  GPA: *4.00/5.00 (Honours with Distinction)*
  Focus Tracks: *Artificial Intelligence, Data Analytics*

Publications and Manuscripts

*** see my Google Scholar for an always up-to-date list.

[1] Jiafei Duan*, **Samson Yu***, Soujanya Poria, Bihan Wen, Cheston Tan. PIP: Physical Interaction Prediction via Mental Simulation with Span Selection. *European Conference on Computer Vision (ECCV) 2022.* (* indicates equal contributions, same for the rest)

[2] Jiahui Huang, Yew Ken Chia, **Samson Yu**, Kevin Yee, Dennis Küster, Eva G Krumhuber, Dorien Herremans, Gemma Roig. Single Image Video Prediction with Auto-Regressive GANs. *Sensors 2022.*

[3] Jieyi Ye, Jiafei Duan, **Samson Yu**, Bihan Wen, Cheston Tan. ABCDE: An Agent-Based Cognitive Development Environment. *IEEE/CVF Computer Vision and Pattern Recognition Conference (CVPR) 2022, Embodied AI Workshop.*

[4] Jiafei Duan, **Samson Yu**, Hui Li Tan, Hongyuan Zhu, Cheston Tan. A Survey Of Embodied AI: From Simulators To Research Tasks. *IEEE Transactions on Emerging Topics in Computational Intelligence (TETCI) 2022.*

[5] **Samson Yu**, Tapas Nayak, Navonil Majumder, Soujanya Poria. Aspect Sentiment Triplet Extraction Using Reinforcement Learning. *ACM International Conference on Information and Knowledge Management (CIKM) 2021.*

[6] Jiafei Duan, **Samson Yu**, Cheston Tan. SPACE: A Simulator for Physical Interactions and Causal Learning in 3D Environments. *IEEE International Conference on Computer Vision (ICCV) 2021, Simulation Technology for Embodied AI (SEAI) Workshop (Spotlight).*

[7] Soujanya Poria, Navonil Majumder, Devamanyu Hazarika, Deepanway Ghosal, Rishabh Bhardwaj, **Samson Yu**, Romila Ghosh, Niyati Chhaya, Alexander Gelbukh, Rada Mihalcea. Recognizing Emotion Cause in Conversations. *Cognitive Computation 2021.*

[8] Jiafei Duan, **Samson Yu**, Hui Li Tan, Cheston Tan. Actionet: An Interactive End-To-End Platform For Task-Based Data Collection And Augmentation In 3D Environment. *IEEE International Conference for Image Processing (ICIP) 2020.*

Research Experiences

- **Agency for Science, Technology and Research** — Singapore
  Centre for Frontier AI Research — *2021.12 - 2022.07*
  Research Engineer, Manager: **Dr. Cheston Tan**
  - **Project 1**: Good Time to Ask: A Learning Framework for Asking for Help in Embodied Visual Navigation
    - Added an ask action to the action space in embodied object navigation that allows the navigation agent to get useful signals from an oracle.
    - Ran experiments for multiple oracle signals, such as progress and instance segmentation.
  - **Project 2**: BOSS: A Benchmark for Human Belief Prediction in Object-context Scenarios
    - Built a dataset that helps machine learning models predict human beliefs in the form of objects during nonverbal communication.
    - Built baseline deep learning models for benchmarks.

- **Singapore University of Technology and Design** — Singapore
  DeCLaRe Lab — *2020.10 - 2021.10*
  Research Officer, Manager: **Prof. Soujanya Poria**
  - **Project 1**: Aspect Sentiment Triplet Extraction (ASTE) Using Reinforcement Learning (ASTE-RL)
    - ASTE-RL [5] was published in CIKM 2021.
    - Proposed a novel hierarchical reinforcement learning approach for ASTE, achieving state-of-the-art (SOTA) results.
  - **Project 2**: SPACE: A Simulator for Physical Interactions and Causal Learning in 3D Environments

    - SPACE [6] was published in the ICCV 2021 Workshop on Simulation Technology for Embodied AI (SEAI) as a spotlight paper.
    - Developed a simulator for generating a synthetic video dataset comprising fundamental physical interactions in a 3D environment.
    - Experiments show that training a SOTA physics model on the SPACE dataset and fine-tuning it on a real-world dataset in a curriculum learning approach give better results than only training it on the real-world dataset.
  - **Project 3**: Recognizing Emotion Cause in Conversations (RECCON)
    - RECCON [7] was published in Cognitive Computation 2021.
    - Helped to create a dataset containing emotion causation at the utterance level through annotations and discussions.
  - **Project 4**: A Survey of Embodied AI: From Simulators to Research Tasks
    - This work [4] was published in TETCI.
    - Researched and analyzed the field of embodied AI.
    - Comprehensively organized the various embodied AI simulators and research tasks, and proposed future directions for the field.
  - **Project 5**: PIP: Physical Interaction Prediction via Mental Simulation with Span Selection
    - PIP [1] was published in ECCV 2022.
    - Developed a novel deep intuitive physics model for predicting the outcomes of physical interactions among objects with added interpretability through span selection.
  - **Project 6**: K-EMERGE
    - Built two models and set up the data processing pipeline for question answering involving knowledge graphs to assist aerospace engineers with jet engine information.
    - Collaborated with five other teams comprising over 20 people.
    - Implemented the PullNet model successfully for 1-hop questions.
    - Edited the KinGDOM model to incorporate knowledge graphs and allow for machine reading comprehension.

Singapore University of Technology and Design Singapore
- *Information Systems Technology and Design* *2019.09 - 2020.08*

Final Year Student, Advisors: **Prof. Ioannis Panageas, Dr. Hongyuan Zhu**
  - **Project 1**: Autonomous robot for shelf management
    - Built an autonomous shelf management robot that uses computer vision to identify important scenarios like out-of-stock items for my final year project.
    - Customized the YOLOv5 model for robust object detection.
    - Created a custom dataset for the supermarket use case.
  - **Project 2**: Single Image Video Prediction with Auto-Regressive GANs
    - This work [3] was published in Sensors.
    - Ran models that generated future frame predictions of facial expressions of multiple emotions.

Agency for Science, Technology and Research Singapore
- *Artificial Intelligence Initiative* *2019.05 - 2019.12*

Research Intern, Managers: **Dr. Cheston Tan, Dr. Hongyuan Zhu**
  - **Project 1**: Actionet: An Interactive End-To-End Platform For Task-Based Data Collection And Augmentation In 3D Environment
    - Actionet [8] was published in ICIP 2020.
    - Created Actionet, a 3D household task dataset that can be automatically augmented with randomized positions and different image sizes.
    - Customized Allen Institute for AI's iTHOR simulator by changing initial scene configurations.

Honors and Awards

- **2022.08**: NUS MComp Study Award
- **2019.12**: SUTD ISTD Machine Learning Course Design Challenge, Winner (1/58)
- **2019.09**: Singapore-India Hackathon 2019, 1st Runner-Up (2/20)
- **2019.04**: DBS X GovTech X SUTD Smart City Challenge 2019, 2nd Runner-Up (3/17)
- **2017.05**: SUTD Undergraduate Scholarship

Certifications

- **2019**: AI for Industry - Practical Foundations in AI with Python
- **2019**: Data Scientist with Python (DataCamp)

Technical Skills

- **Deep Learning Frameworks**: PyTorch, TensorFlow, Keras
- **Programming Languages**: Python, C#
- **Additional Skills**: Linux, Git, Scikit-learn, NLTK, SpaCy, CUDA, Flask

Volunteer Experience

The Conference on Computer Vision and Pattern Recognition (CVPR) 2022 Singapore
- *Reviewer* *2022.01 - 2022.01*