Zhiruo Zhou

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EDUCATION BACKGROUND

University of Southern California (USC), Los Angeles, CA *Aug 2018 - (Expected) May 2023*
Ph.D. Student in Electrical and Computer Engineering, supervised by Prof. C.-C. Jay Kuo
GPA: **3.94**/4.0 Awards: Annenberg Fellowship 2018, ECE Department

TSINGHUA UNIVERSITY, Beijing, China *Aug 2014 - Jul 2018*
Bachelor of Engineering in Electrical Engineering
GPA: **92**/100 (= **3.9**/4.0) Rank: **12**/242 (top 5 female students) Awards: Tsinghua Excellent Undergraduates (top 8%)

PROFESSIONAL EXPERIENCE

Applied Scientist Intern, Amazon Search M5, Seattle, US *May 2022 - Aug 2022*
`Python,PyTorch` | Video-Language Pre-training
- Proposed a simple yet effective model for Video-Language pre-training by incorporating the self-supervised video task masked video modeling (MVM) with cross-modality alignment and adopting temporal curriculum training.
- Our proposed method outperforms the recent state-of-the-art ALPRO on both text-video retrieval and action classification downstream tasks, yet with a much simpler framework and pre-training strategy.

Member of IEEEXtreme Judge Committee *Jul 2020 - Present*
`Python,C++` | problems design for the annual competitive programming challenge held by IEEE (14.0) (15.0)
- Contributed problems to IEEEXtreme Programming Competition, designing full/partial score solution and data.

Software Engineer Intern, Map Content Department of Baidu Inc, Beijing, China *Oct 2017 - Jan 2018*
`Python` | text mining on real-world large-scale data
- Performed the text mining of show-tag (an attribute of interested points on the map) and designed a probability-based word splitting algorithm. The data consists of organized data and raw data fetched from user responses.
- Improved the accuracy and coverage ratio of online show-tag significantly. Results got updated to the app and served nationwide users . Won the excellent project award in the Map Content Department.

RESEARCH EXPERIENCE

Light-Weight High-Performance Unsupervised Single Object Tracking | USC *Jan 2020 - Present*
`Python,MATLAB,C++` | funded by US Army Research Laboratory
- Proposed unsupervised lightweight single object trackers with novel modules including background motion modeling, lost object discovery and color-saliency-based box refinement.
- Our method has superior or comparable performance with state-of-the-art deep learning methods and runs in real-time (20 FPS on one-core CPU) with tiny model size less than 1MB.

Automatic Detection of Artifacts on Device Surfaces Captured by Cameras | USC *Sep 2018 - May 2019*
`Python` | funded by United Microelectronics Corporation
- Proposed and implemented a real-time device detection and classification system via Saab transform (a data-driven representation learning technique), SVM and hard-sample mining techniques.
- The system doesn't need labeled data and can be trained within 5 mins on CPU and performs well on unseen data.

PUBLICATIONS

- Zhou, Zhiruo, et al. "UHP-SOT: An Unsupervised High-Performance Single Object Tracker." *2021 International Conference on Visual Communications and Image Processing (VCIP)*. IEEE, 2021. (link)
- Zhou, Zhiruo, et al. "Light-Weight High-Performance Object Tracking" Oral presentation, NAML2021. (link)
- Zhou, Zhiruo, et al. "Unsupervised Lightweight Single Object Tracking with UHP-SOT++." *arXiv preprint arXiv:2111.07548* (2021). Accepted by APSIPA Transactions on Signal and Information Processing. (link)
- Zhou, Zhiruo, et al. "GUSOT: Green and Unsupervised Single Object Tracking for Long Video Sequences." arXiv preprint arXiv:2207.07629 (2022). Accepted by IEEE MMSP2022. (link)
- Lin, Ruiyuan, et al. "From Two-Class Linear Discriminant Analysis to Interpretable Multilayer Perceptron Design." *arXiv preprint arXiv:2009.04442* (2020). Accepted by TNNLS. Second author. (link)

OTHER EXPERIENCE & SKILLS

TA of course: Digital Image Processing, Machine Learning from Signals. (USC) *Spring 2020 - Fall 2022*
Board member of Project Group of EE Student Association for Science and Technology, Tsinghua Univ. *2015 – 2017*
- **Programming languages:** `Python`, `C++`, `Shell`, `MATLAB`, `Verilog`.
- **Tools:** GitHub, Docker, PyTorch, Anaconda, Visual Studio, PyCharm, Multisim, ModelSim, Vivado.