Kaveh Safavigerdini

Curriculum Vitae

510 High St., Columbia, Mo
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Lab Page
Google Scholar

EDUCATION

2021 – 2025 **Doctor of Philosophy**
COMPUTER VISION, DEPT. EE & CS
University of Missouri - Columbia

2021 – 2022 **Master of Science**
COMPUTER VISION, DEPT. EE & CS
University of Missouri - Columbia

2010 – 2016 **Master & Bachelor of Science**
DYNAMICAL SYSTEMS & CONTROL THEORY
Sharif University of Technology

DOCTORAL RESEARCH (ALGORITHMS)

"Real-Time Feature Tracking in Image Sequences"

Developing high-speed algorithms for real-time feature tracking using deep feature detection and matching techniques.

"Enhancing Point Tracking Methods:"

Improving spatial point tracking accuracy through the integration of advanced techniques: PIPs, OmniMotion, RAFT, and CoTracker.

"Coarse-to-fine feature keypoint tracks using Transformer "

Developed a Transformer-based method for pixel-level accurate keypoint tracking, improving SfM and feature point tracking applications.

"Developing 3D Measurement Tool for WAMI dataset:"

Developing a cross-platform 3D measurement tool and GUI annotation tool for analyzing large photogrammetric datasets.

DOCTORAL RESEARCH (APPLICATIONS)

"Predicting mechanical properties of CNTs images"

Developing a deep learning method using ResNeXt and Random Forest to predict CNT forest mechanical properties from multi-layer imagery.

"Kinematic Analysis and Shape Estimation of CNT Pillars"

Using developed feature tracking algorithms to analysing carbon nanotube growth rate and estimating thier pillar shapes.

"Horse Lameness Detection through Video Point Tracking"

Developed a highly accurate point tracking pipeline for analyzing horse skeleton movement to detect lameness.

ACADEMIC SKILLS

- Computer Vision: Object Detection and Tracking, Image classification/Segmentation, GANs, Pose Estimation
- Control Theory: Control Systems, System Identification, Dynamical Systems and Algorithm Optimization
- Programming: Pytorch, Python, C++, Qt

PROFESSIONAL SKILLS

- Team Leadership, Project Management and Valuable Industry Contributor
- Business Strategy and Analysis (MBA degree)

PUBLICATIONS

K Safavigerdini, et al. (2023). Predicting Mechanical Properties of CNT Images Using MLS. IEEE **ICIP** 3264-3268.

K Safavigerdini, et al. (2024). Kinematic Analysis of CNTs Using Deep Feature Tracking. subm. *IEEE **WACV***.

K Safavigerdini, et al. (2023). Creating semi-Quanta MLS CNT images using CycleGAN *IEEE **AIPR***.

Surya,... **K Safavigerdini**, et al. (2024). CNT Forest Self-Assembly Insights from In-situ ESEM Synthesis. **Carbon**.

B Yaghooti, **K Safavigerdini**, et al. (2023). Stabilizing unstable periodic orbit of unknown fractional-order systems via adaptive delayed feedback control. *Proc. **ImechE***.

B Yaghooti, A Siahi, **K Safavigerdini**, et al. (2020) Adaptive synchronization of uncertain fractional-order chaotic systems using sliding mode control techniques. Proc. **ImechE**.

WORK EXPERIENCE

OCT 2018 – OCT 2019 (FT)
Online Monitoring of Tehran's Air Pollution
Team Leader

MAY 2023 – AUG 2023 (FT)
Motion and Eye-Tracking Data in Augmented Reality Learning
Internship Researcher

REFERENCES

Dr. Kannappan Palaniappan
POSITION Dist. Prof., ECE, UM-Columbia
CONTACT pal@missouri.edu, +1 573-884-9266

Dr. Matthew R. Maschmann
POSITION Assoc. Prof., ME & AE, UM-Columbia
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Dr. Filiz Bunyak
POSITION Assist. Prof., ECE, UM-Columbia
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