Advanced Control and Intelligent Systems (ACIS) Laboratory

Michèle Pujol Room, Student Union Building
University of Victoria
3800 Finnerty Road
Victoria BC V8P 5C2
Canada

ACIS Research Symposium
May 17-19, 2023

Applied AI & Industry

Transformation of Industry by AI: Challenges and Opportunities

The Research Partnerships Office and the Coast Capital Innovation Centre at University of Victoria invite you to join the **2023 Research Symposium on Applied AI** led by the ACIS Laboratory. We will highlight some interesting results from our research collaborations. This forum will also provide participants with networking opportunity to exchange and explore ideas that may spark industry-academia collaborations and international research partnerships. Please check ACIS 2023 Symposium for more details.

University of Victoria

Presentation Titles

Wednesday May 17, 2023	**Day 1 – AI and Robots**		**Presentation Title**
8:30-9:00	Arrival and Breakfast		
9:00-9:10	*Opening remarks*	Dr. F. Hof (UVic AVPR)	Opening remarks
9:10-9:20	*ACIS Lab*	Dr. H. Najjaran	Overview of ACIS lab research themes
9:20-9:50 9:50-10:10 10:10-10:30	*AI for mobile & service robots*	Dr. D. Gruyer (Gustav Eiffel Univ.) † M. Peussner (Rosen Group) Dr. M. Salimi (Sentire)	Evaluation and validation process for AI-based systems: applied to automated mobility Research & Development of the ROSEN Group – Autonomous tank inspection support Adaptive AI for autonomous service robots
10:30-10:45	Coffee Break		
10:45-11:10 11:10-11:30 11:30-11:55 11:55-12:15	*AI for mobile & service robots*	N. Mahdian & M. Jani (ACIS) J. Chung (ACIS) Dr. Y. Younes (ACIS) Dr. J. Fayyad (ACIS)	Unsupervised multi-object tracking algorithm with adaptive track-matching Multi-agent path finding approaches using deep reinforcement learning A systematic mixed-precision post-training quantization based on KL divergence distance Out-of-distribution detection using inter-level-features of the deep neural networks
12:15-13:00	Lunch Break		
13:00-13:25 13:25-13:50 13:50-14:10 14:10-14:30	*AI for industrial robots*	A. Nozdryn (Apera AI) M. Riedlinger (Fraunhofer, IOSB-INA) T. Oelschlagel, Dr. N. Ivankov (Resolto) M. Ghafarian & H. Honari (ACIS)	A vast and rewarding problem space: Engineering industrial robots at Apera AI AI-driven collaborative robots Yolo a theoretic approach End-to-end deep learning-based framework for path planning and collision checking
14:30-14:45	Coffee Break		
14:45-15:00 15:00-15:15 15:15-15:45 15:45-16:05 16:05-16:30	*AI for industrial robots*	Dr. JF Gamache (Kinova) † M. Koerber (Franka Emika) † H. Weber (DLR) A. Soufi (ACIS) J. Hong (ACIS)	Applications of AI to industrial robots at Kinova AI-enabled highly adaptive robots for manufacturing Asset administration shells as standardized interface between real assets and digital twins Sim-to-real by intrinsic stochasticity of real-time simulation Human-Robot skill transfer with enhanced compliance
17:00	**Visit to Camosun Innovate**		

Thursday May 18, 2023	***Day 2* – AI for Perception and Inspection**		**Presentation Title**
8:30-9:00	Arrival and Breakfast		
9:00-10:30	*AI powered aerial photogrammetry*	Dr. I. Mantegh (NRC Canada) Dr. M. Bolic (UOttawa, CARG) Dr. V. Mehta (NRC Canada)	Advanced aerial mobility and counter UAS at NRC UAS object detection and classification system UAV data collection and algorithm development
10:30-10:45	Coffee Break		
10:45-11:10 11:10-11:50 11:50-12:15	*AI powered aerial photogrammetry*	S. Soutoni (ACIS) S. Hatami & M. Tucsok (ACIS) J. Sol (ACIS)	Technical challenges of aerial high-precision industrial photogrammetry using multiple UAVs A deep learning approach to active 3D reconstruction Soft material simulation for pre-training of condition assessment models
12:15-13:00	Lunch Break		
13:00-14:00	*AI in composite manufacturing*	Dr. A. Poursartip (UBC) Dr. G. Fernlund (Convergent) Y. Esmaeili (ACIS)	Composites Research Network Intelligent vacuum bagging leakage detection using physics-informed grid neural network
14:00-14:30	*AI for inspection and quality control*	C. Lavigne (LlamaZOO) G. Lund (Fives Lund) A. Ghamisi (ACIS)	Anomaly detection in automated fiber placement
14:30-14:45	Coffee Break		
14:45-15:00	*Human robot collaboration*	Dr. D. Mukherjee (ACIS)	Multi-modal communication for human robot collaboration
15:30	**Lab tours and demos (Outdoor)**		

Friday May 19, 2023	**Day 3 – AI and Industry**		**Presentation Title**
8:30-9:00	Arrival and Breakfast		
9:00-9:30	*AI ecosystem in the UK*	Dr. M. Rivero-Huguet (British High Commission) †	AI ecosystem in the UK
9:30-10:00 10:00-10:30	*AI in manufacturing systems*	C. Meenavilli, Dr. S. Ranjan (NTWIST) † M. Bause, S. Koppert (Fraunhofer IEM)	AI for operational excellence Trustworthy AI in engineering and manufacturing
10:30-10:45	Coffee Break		
10:45-11:00 11:00-11:15 11:15-11:30	*AI in manufacturing systems*	M. Khadivi (ACIS) S. Oluwaseyi (ACIS) M. Ahang (ACIS)	Scheduling in manufacturing systems Prognostics strategies for condition-based maintenance Intelligent condition monitoring of industrial plants (Dealing with scarce abnormal data)
11:30-11:45 11:45-12:00 12:00-12:15	*Machine learning for oil and gas best practices*	Dr. Lasserre, Dr. Lucet (UBC Okanagan) J. Gregg (BC Energy Regulators) Dr. N. Islam, B. Knight, C. Bond (UBC Okanagan)	Introduction to BC-ER open challenges Predicting remaining useful life of oil and gas wells Forecasting application timelines for BC-ER using machine learning
12:30-13:30	Lunch Break		
13:30-14:00	*AI for data security and fraud detection*	M. Mirani, A. Siddhartha (Mastercard) A. Shojaeinasab (ACIS)	Unveiling blockchain vulnerabilities: fraudulent on-chain activities and identification attacks
14:00-14:30	*ML in quantum science*	Dr. T. E. Baker (UVic)	Overview of methods of quantum machine learning on classical and quantum computers
14:30-14:45	Coffee Break		
14:45-15:15	*AWS Research*	A. Rodrigues, S. Beara (AWS) †	Accelerating academic research with Cloud
15:30-16:30	**Lab tours and demos (Indoor- ACIS Lab ECS 349)**		

† Remote presenters connected via Zoom