

6TH ANNUAL

INTELLIGENCE COMMUNITY ACADEMIC RESEARCH SYMPOSIUM

Agenda



SESSIONS, WEDNESDAY, 16 SEPTEMBER 2020

Session One	Automatic Feature Extraction/Mapping	Session Two	Big Data/Network Analytics	Session Three	Geophysics/Sensors
12:00 - 12:10	ICARS Opening Introduction ODNI Director of Science and Technology, Dr. John Beiler	12:00 - 12:10	ICARS Opening Introduction ODNI Director of Science and Technology, Dr. John Beiler	12:00 - 12:10	ICARS Opening Introduction ODNI Director of Science and Technology, Dr. John Beiler
12:10 - 12:40	Dr. Curt Davis : DeePRK - Measuring Human Performance of DNN-Assisted Object Search and Detection over North Korea	12:10 - 12:40	Dr. Lisa Durbeck : Scalable Incremental Partitioning of Sparse Stochastic Block Model Graphs	12:10 - 12:40	Dr. Felipe Guzman : Optomechanical Gravimeters and Gravity Gradiometers
12:40 - 12:50	Break	12:40 - 12:50	Break	12:40 - 12:50	Break
12:50 - 1:20	Dr. Panos Markopoulos : Improving CNNs Towards Real-Time Multi-Modal Object Detection in Remote Sensing Imagery	12:50 - 1:20	Break	12:50 - 1:20	Adam Hines : Optomechanical Inertial Sensors for Gravimetry
1:30 - 1:40	Break	1:30 - 1:40	Break	1:30 - 1:40	Break
1:40 - 2:10	Dr. Preston Hartzell : Robust Confidence Measures for Multi-Temporal 3D Spatial Change Detection	1:40 - 2:10	Mitchell Plyler : Counterfactual Explanations for Text Classifiers	1:40 - 2:10	Andrea Nelson : Compact Quasi-Monolithic Heterodyne Laser Interferometers
2:10 - 2:20	Break	2:10 - 2:20	Break	2:10 - 2:20	Break
2:20 - 2:50	Dr. Shashi Shekhar : Identifying Aberration Patterns in Multi-attribute Trajectory Data with Gaps	2:20 - 2:50	Dr. Cedric Spire : Automated Error Detection & Repair in Structured Databases	2:20 - 2:50	Dr. Logan Richardson : Hybridizing High Bandwidth Optomechanical Accelerometers with Atom Interferometers for Improved Inertial Measurements
2:50 - 3:00	Break	2:50 - 3:00	Break	2:50 - 3:00	Break
3:00 - 3:30	Dr. Eduardo Blanco : Mining Spatiotemporal Knowledge from Language and Images	3:00 - 3:30	Dr. Rebecca Willett : Analysis of High-Dimensional Autoregression Point Processes	3:00 - 3:30	
Session Four	Power Sources/Energy	Session Five	Predictive Analytics	Session Six	Quantum
12:00 - 12:10	ICARS Opening Introduction ODNI Director of Science and Technology, Dr. John Beiler	12:00 - 12:10	ICARS Opening Introduction ODNI Director of Science and Technology, Dr. John Beiler	12:00 - 12:10	ICARS Opening Introduction ODNI Director of Science and Technology, Dr. John Beiler
12:10 - 12:40	Dr. Nathan Banek : Sustainable Conversion of Biomass to Li-ion Grade Graphite	12:10 - 12:40	Dr. Raoul Guiazon : Intrusion Detection Systems for Sensor Networks	12:10 - 12:40	Dr. Mattias Fitzpatrick : Charge State Dynamics and OD-ESR Contrast of Shallow NV Centers in Diamond
12:40 - 12:50	Break	12:40 - 12:50	Break	12:40 - 12:50	Break
12:50 - 1:20	Dr. Candace Chan : Integrated Foldable Battery and Components with Flexible/Stretchable Interconnects	12:50 - 1:20	Dr. Jerone Andrews : Conditional Adversarial Camera Model Anonymisation	12:50 - 1:20	Dr. Laura Kim : Plasmonic Quantum Metasurfaces Using Nitrogen-Vacancy Ensembles
1:30 - 1:40	Break	1:30 - 1:40	Break	1:30 - 1:40	Break
1:40 - 2:10	Dr. John Chivers : An Integrated System for Thermophotovoltaic Power Generation	1:40 - 2:10	CPT Alexander Pytlar : Understanding the Urban Environment: A New Framework for Urban Resilience and Stability	1:40 - 2:10	Dr. Sara Mouradian : Trapped Ions as Useful Quantum Sensors
2:10 - 2:20	Break	2:10 - 2:20	Break	2:10 - 2:20	Break
2:20 - 2:50	Dr. Jeffery Lopez : Understanding and Design of Materials for High Energy Density Batteries	2:20 - 2:50	Dr. Daniel Becker : Modeling Changes in Migratory Behavior as a Driver of Zoonotic Disease in an Avian Host	2:20 - 2:50	Dr. Harry Bostock : Developing a Trapped Ion Quantum RF and Microwave Sensor
2:50 - 3:00	Break	2:50 - 3:00	Break	2:50 - 3:00	Break
3:00 - 3:30	Dr. Yuzhang Li : Graphene Cage Design and Cryo-Electron Microscopy Characterization for High Energy Batteries	3:00 - 3:30	Dr. Yun Tao : Transient Dynamics in Outbreak Management and a Retrospective Analysis of the 2001 FMDV Epidemic in the United Kingdom	3:00 - 3:30	Dr. Dodd Gray, Jr. : Hybrid CMOS-LiNbO ₃ Optical Frequency Comb Integrated with Trapped-Ion Optical Clocks

SESSIONS, WEDNESDAY, 23 SEPTEMBER 2020

Session One Big Data/Network Analytics

- 12:00 - 12:10 ICARS Opening Introduction
ODNI Director of Science and Technology, Dr. **John Beiler**
- 12:10 - 12:40 Dr. **Guillermo Sapiro**: Learning Privacy and Do-No-Unnecessary-Harm Fairness
- 12:40 - 12:50 Break**
- 12:50 - 1:20 Dr. **Joseph Shaheen**: Towards a Principled, Computational and Risk-Based Perspective in Dark Networks
- 1:30 - 1:40 Break**
- 1:40 - 2:50 Drs. **Deepti Joshi** and **Leen-Kiat Soh**: Leveraging Environment and Culture to Anticipate Social Unrest with Integrated Model-and Data-Driven Approaches
- Drs. **Regina Werum** and **Ashok Samal**: Leveraging Environment and Culture to Anticipate Social Unrest with Integrated Model-and Data-Driven Approaches
- 2:50 - 3:00 Break**
- 3:00 - 3:30 Drs. **Karina Mrakovcich** and **Christopher LaMonica**: Exploring the Links Between Food Insecurity and Maritime Crime in Coastal West Africa

Session Two Special Materials

- 12:00 - 12:10 ICARS Opening Introduction
ODNI Director of Science and Technology, Dr. **John Beiler**
- 12:10 - 12:40 Dr. **Nathan Carter**: Development and Direct-Write Printing of Low-temperature Sintering Inks on Flexible and Self-healing Substrates
- 12:40 - 12:50 Break**
- 12:50 - 1:20 Dr. **Luce le Gorrec**: Scalable Partitioning of Large Complex Networks
- 1:30 - 1:40 Break**
- 1:40 - 2:10 Dr. **Michael Jessor-Stone**: Frequency and Energy Methods in Direct Shear Behavior of Ultra-High Performance Concrete
- 2:10 - 2:20 Break**
- 2:20 - 2:50 Dr. **Martin Smyth**: Information Processing on Social Media Networks as Emergent Collective Intelligence
- 2:50 - 3:00 Break**
- 3:00 - 3:30 Dr. **Helen Tran**: Stretchable and Fully Degradable Semiconductors for Transient Electronics

Session Three Geophysics/Sensors

- 12:00 - 12:10 ICARS Opening Introduction
ODNI Director of Science and Technology, Dr. **John Beiler**
- 12:10 - 12:40 Dr. **Michael Ketterer**: Uranium Isoscapes: Examining the Geospatial Distribution of Natural and Anthropogenic Sources
- 12:40 - 12:50 Break**
- 12:50 - 1:20 Dr. **Juliette Jordan**: Early Detection of Chemical-Induced Temporal Stress Signatures in GMO and Non-GMO Maize (by Carbon NT Release)
- 1:30 - 1:40 Break**
- 1:40 - 2:10 Dr. **Nabila Lichiheb**: Improving the Prediction of Hazardous Material Dispersion in an Urban Environment
- 2:10 - 2:20 Break**
- 2:20 - 2:50 Dr. **Keng Tiong Ng**: Identification of Illegal Threat Manufacturing Activity via Wastewater Markers
- 2:50 - 3:00 Break**
- 3:00 - 3:30 Dr. **Sunita Yadav**: Monitoring Agricultural Croplands Using Optical Time Series Imagery Data

Session Four Spectral Science

- 12:00 - 12:10 ICARS Opening Introduction
ODNI Director of Science and Technology, Dr. **John Beiler**
- 12:10 - 12:40 Dr. **Shawn Serbin**: Plant Spies: Using Foliar Messages to Remotely Detect Tunneling
- 12:40 - 12:50 Break**
- 12:50 - 1:20 Dr. **David Messinger**: Radiometrically Accurate Spatial Resolution Enhancement of Spectral Imagery for Improved Exploitation
- 1:30 - 1:40 Break**
- 1:40 - 2:10 Dr. **Jan van Aardt**: Toward Enhanced 3D Sub-Canopy Mapping via Airborne/Spaceborne Full-Waveform LiDAR
- 2:10 - 2:20 Break**
- 2:20 - 2:50 **Steven Spiegel**: LiDAR Classification using Synthetic Data
- 2:50 - 3:00 Break**
- 3:00 - 3:30 Dr. **Kevin Dobbs**: Rapid Mapping Flood Inundation from the May 2020 Edenville, Michigan Dam Break

Session Five Automatic Feature Extraction/Mapping

- 12:00 - 12:10 ICARS Opening Introduction
ODNI Director of Science and Technology, Dr. **John Beiler**
- 12:10 - 12:40 Dr. **Laurie Baise**: Benchmark Data Development to Classify Damage for Natural Disaster Relief Efforts
- 12:40 - 12:50 Break**
- 12:50 - 1:20 Dr. **Gordon Christie**: Semantic Representations for Multi-Viewpoint Multimodal Geolocation
- 1:30 - 1:40 Break**
- 1:40 - 2:10 Dr. **Ryan Corey**: Cooperative Listening with Networked Audio Devices
- 2:10 - 2:20 Break**
- 2:20 - 2:50 Dr. **Katherine McCormick**: Toward a Sensitive, High-Resolution Atomic Magnetometer Based on Feshbach Resonances
- 2:50 - 3:00 Break**
- 3:00 - 3:30 Dr. **Dieter Pfoser**: Generation and Management of Crowdsourced Place Gazetteers

Session Six Robotics

- 12:00 - 12:10 ICARS Opening Introduction
ODNI Director of Science and Technology, Dr. **John Beiler**
- 12:10 - 12:40 Dr. **Neel Doshi**: Planning and Control of Robotic Manipulation Primitives
- 12:40 - 12:50 Break**
- 12:50 - 1:20 Dr. **David Limbaugh**: The Cognitive Process Ontology and Modeling Autonomous Machines
- 1:30 - 1:40 Break**
- 1:40 - 2:10 Dr. **Bryce Doerr**: Motion Planning and Control for On-Orbit Assembly using LQR-RRT* and Nonlinear MPC
- 2:10 - 2:20 Break**
- 2:20 - 2:50 Dr. **Daniel Drew**: New Directions for Designing Effective and Efficient Microrobots
- 2:50 - 3:00 Break**
- 3:00 - 3:30 Dr. **Tim Helps**: Insect-Inspired Semi-Autonomous Agents for Remote Missions

SESSIONS, WEDNESDAY, 30TH SEPTEMBER 2020

Session One Quantum	
12:00 - 12:10	ICARS Opening Introduction ODNI Director of Science and Technology, Dr. John Beiler
12:10 - 12:40	Dr. Lia Ying Li : Optomechanical Sensors: Rapid Prototyping for Navigation and Quantum Technologies
12:40 - 12:50	Break
12:50 - 1:20	Dr. Loren Alegria : High-Energy Quasiparticle Injection in Mesoscopic Superconductors
1:30 - 1:40	Break
1:40 - 2:10	Dr. Robert Pettit : Quantum Communication by Optical Fiber Links Using Quantum Dot Molecules
2:10 - 2:20	Break
2:20 - 2:50	Dr. John Serafini : A Compact Configuration for Two-Photon Interference to Support Quantum Computing
2:50 - 3:00	Break
3:00 - 3:30	Dr. Claire Marvinsky : Position-Dependent Response of Large-Area Superconducting Nanowire Single Photon Detectors

Session Two Geophysics/Sensors	
12:00 - 12:10	ICARS Opening Introduction ODNI Director of Science and Technology, Dr. John Beiler
12:10 - 12:40	Dr. Manoranjan Majji : Geomagnetic Sensor Fusion for Alternative Positioning and Navigation
12:40 - 12:50	Break
12:50 - 1:20	Dr. Janna Caspersen
1:30 - 1:40	Break
1:40 - 2:10	Dr. Pencho Petrushev : Oblique Derivative Boundary Value Problem with Application to Geomagnetic Field Modeling
2:10 - 2:20	Break
2:20 - 2:50	Dr. May Kim : Improving the Stability of Atomic Clocks Using a Multi-Ensemble Protocol and Adaptive Optimization with a Servo Feedback Scheme
2:50 - 3:00	Break
3:00 - 3:30	Christopher Linick : Sources of Small-Scale Gravity Variations at a Coastal Site

Session Three Spectral Science	
12:00 - 12:10	ICARS Opening Introduction ODNI Director of Science and Technology, Dr. John Beiler
12:10 - 12:40	Dr. Aswin Sankaranarayanan : Optical Computing for Hyperspectral Imaging and Material Classification
12:40 - 12:50	Break
12:50 - 1:20	Dr. David Benirschke : Frequency Comb Based Hyperspectral Imaging Systems
1:30 - 1:40	Break
1:40 - 2:10	Dr. John Beck : Spatial Dynamics and Analysis of Crops Using Super Multispectral Image Resolution and Radar Fusion
2:10 - 2:20	Break
2:20 - 2:50	Dr. Charles Bachmann : Hyperspectral Video Imaging and Mapping of Littoral Conditions
2:50 - 3:00	Break
3:00 - 3:30	SMSgt Robert Colter : Identifying Influence Behaviors Among Nationally Sorted GitHub User Populations

Session Four Predictive Analytics	
12:00 - 12:10	ICARS Opening Introduction ODNI Director of Science and Technology, Dr. John Beiler
12:10 - 12:40	Dr. David Harris : Evaluating Virtual Reality Training of Cognitive Skills for Counter Terror Policing
12:40 - 12:50	Break
12:50 - 1:20	Dr. Christine Brugh : The Heterogeneity of Terrorist Actors and Outcomes
1:30 - 1:40	Break
1:40 - 2:10	Dr. Andrea Bertozzi , Bohan Chen , and Dr. Christian Parkinson : Sparsity Models for Spatiotemporal Analysis and Modeling of Human Activity and Social Networks in a Geographic Context
2:10 - 2:20	Break
2:20 - 2:50	Drs. Alvitta Ottley and R. Jordan Crouser : The Role of Individual Differences in Moderating Complex Analytic Workflows
2:50 - 3:00	Break
3:00 - 3:30	Dr. Christopher Metzler : Data-Driven Solutions to Challenging Imaging Problems

Session Five Special Materials	
12:00 - 12:10	ICARS Opening Introduction ODNI Director of Science and Technology, Dr. John Beiler
12:10 - 12:40	Stephen Bass : Electrically Reconfigurable Antennas
12:40 - 12:50	Break
12:50 - 1:20	Dr. Michelle Povinelli : Designing Microstructured Materials with Tailored Thermal Emission
1:30 - 1:40	Break
1:40 - 2:10	Dr. Albert Ryou : Ultra-Low-Power Microwave-to-Optical Signal Transducers to Facilitate Deep Neural Net Operation
2:10 - 2:20	Break
2:20 - 2:50	Dr. Candace Chan : Expanded Temperature Range Li-Ion Battery Electrolytes Using Eutectic Mixtures
2:50 - 3:00	Break
3:00 - 3:30	Rachel Jones : Lineament Extraction from SAR and Magnetometry Fused Data Products for Groundwater Potentiality Exploration

Session Six Robotics	
12:00 - 12:10	ICARS Opening Introduction ODNI Director of Science and Technology, Dr. John Beiler
12:10 - 12:40	Dr. Edmund Hunt : Risk-Sensitive Robot Swarms for Effective Environmental Monitoring and Anomaly Investigation
12:40 - 12:50	Break
12:50 - 1:20	Dr. Byong Kwon : Artificial Neural Tissue (ANT)-Controlled Robotic Teams for Spatial Structure Assembly/Inspection/Repair
1:30 - 1:40	Break
1:40 - 2:10	Dr. Jason Gross : Localization and Planning for a UAV/Robot Team in Subterranean Environments
2:10 - 2:20	Break
2:20 - 2:50	Dr. Charles Toth : Scalable Collaborative Swarm Mapping in GNSS-Denied Environments
2:50 - 3:00	Break
3:00 - 3:30	Dr. Jorge Chen : Mobile Indoor Laser Scanning Using COTS and Open Source