**IUTAM Symposium on Optimal Guidance and Control for Autonomous Systems**

**University of Hawaiʻi at Manoā**

**East West Center**

**March 15 – 17, 2023**

**Day 1: Wednesday, March 15, 2023**

**Location: Pacific Room, East West Center**

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| 8:30 AM | **Registration & Sign In** |
| **MORNING SESSION 1: Welcome! [9:00 – 10:05 AM]** | |
| 9:00 – 9:10 AM | **Welcome and Introduction**  Dr. Dilmurat Azimov, *Associate Professor, University of Hawaiʻi at Manoā Department of Mechanical Engineering, IUTAM Symposium Chair* |
| 9:10 – 9:30 AM | **Opening Remarks**  Dr. Vassilis Syrmos, *Professor, the Vice President for Research and Innovation of the University of Hawai’i System* |
| 9:30 – 10:05 AM | **Featured Lecture:** **Nā Mea ʻIke ʻIa Cultural Presentation**  Kumu Brad Lum |
| 10:10 – 10:25 AM | **Coffee Break** |
| **MORNING SESSION 2: Guidance, Navigation and Control (GNC) [10:30 AM – 12:15 PM]** | |
| 10:30 – 11:05 AM | **Mathematical Modeling for Precision Navigation by Tracking Ground Targets**  Robert H. Bishop |
| 11:05 – 11:40 AM | **Force Estimation and Control Enhanced by a Force-Derivative Sensor**  Yu-Sheng Lu, Liang-Hao Chen |
| 11:40 AM – 12:15 PM | **Iterative Control Framework with Application to Space Docking**  Xun Liu, Hashem Ashrafiuon, Sergey G. Nersesov |
| 12:15 – 1:15 PM | **Lunch**  *Location: Makana Room, East West Center* |
| **AFTERNOON SESSION 1: GNC & Sensor Technologies [1:15 – 2:25 PM]** | |
| 1:15 – 1:50 PM | **Detection, Classification and Tracking Challenges in Acoustics**  John S. Allen III |
| 1:50 – 2:25 PM | **ESA Technology Developments in Vision-based Navigation**  Olivier Dubois-Matra, Massimo Casasco, Manuel Sanchez Gestido, Irene Huertas |
| 2:30 – 2:45 PM | **Coffee Break** |
| **AFTERNOON SESSION 2: GNC & Robotic Technologies [2:50 – 4:15 PM]** | |
| 2:50 – 3:15 PM | **Performance Evaluation of Real World Clicker Fine-tuning Operation Method Based on Manipulability of a Robot Arm**  Shin-ichiro Sakamoto, Keigo Noguchi, Satoshi Iwaki |
| 3:15 – 3:40 PM | **Mobile Robot Guidance Method Using Laser Spots Irradiated on the Floor from Real World Clicker and its Application for Object Grasping System**  Keigo Noguchi, Shin-ichiro Sakamoto, Satoshi Iwaki |
| 3:40 – 4:15 PM | **Extending Explicit Guidance Methods to Higher Dimensions, Additional Conditions, and Higher Order Integration**  Evan Kawamura, Dilmurat Azimov |
| 5:00 – 6:30 PM | **Tea Gathering - Informal Social Networking Event**  *Location: Makana Room, East-West Center* |

**Day 2: Thursday, March 16, 2023**

**Location: Pacific Room, East West Center**

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| 8:30 AM | **Registration & Sign In** |
| **MORNING SESSION 1: Robotic Technologies [9:00 – 10:45 AM]** | |
| 9:00 – 9:35 AM | **Development of a Simulator for Operator Proficiency Training for Seafloor Exploration by Remotely Operated Vehicle**  Ryusei Kamewari, Yusuke Fujishima, Kuniaki Kawabata, Kenta Suzuki, Norimitsu Sakagami, Fumiaki Takemura, Satoru Takahashi |
| 9:35 – 10:10 AM | **Identifying Consumer Drones Via Encrypted Traffic**  David Liang, Yingfei Dong |
| 10:10 – 10:45 AM | **Optimization of the Four Coil Configuration for Single Magnet Levitation from Below**  Peter Berkelman, Steven Kang |
| 10:50 – 11:05 AM | **Coffee Break** |
| **MORNING SESSION 2: Stochastic Systems & Game Theory [11:10 AM – 12:20 PM]** | |
| 11:10 – 11:45 AM | **Assigning Probability Distributions to the State of Stochastic Systems**  Ali Pakniyat |
| 11:45 AM – 12:20 PM | **Applications of the II-Strategy when Players Move with Acceleration**  Bahrom T. Samatov, Ulmasjon B. Soyibboev |
| 12:20 – 1:20 PM | **Lunch**  *Location: Makana Room, East West Center* |
| **AFTERNOON SESSION 1: Game Theory & Mission Operations [1:20 – 2:30 PM]** | |
| 1:20 – 1:55 PM | **Initial Development of Cooperative Control and Localization of Multiple Spacecraft using a Multi-Agent Mission Operations System**  Trevor Sorensen, Eric Pilger, Miguel Nunes, James Lewis, Scott Ginoza, Zhuoyuan Song, Chris Battista, Lillian Shibata |
| 1:55 – 2:30 PM | **Optimal Number of Pursuers in the Game on the 1-Skeleton of 4D Cube**  Gafurjan Ibragimov, Zahriddin Muminov |
| 2:35 – 2:50 PM | **Coffee Break** |
| **AFTERNOON SESSION 2: Optimal Control & Underwater Vehicles [2:55 – 4:30 PM]** | |
| 2:55 – 3:30 PM | **Development of An Operation Support Device for Portable Underwater Vehicles**  Yu Kimura, Norimitsu Sakagami, Takahiro Wada, Koichi Koganezawa |
| 3:30 – 4:05 PM | **Hamiltonian Distributed Optimal Control of Coupled Finite and Infinite-Dimensional Lagrangian Systems**  Nhan Nguyen |
| 4.05-4.40 PM | **Optimal control of thermal processes in a nonlinear inverse problem with redefinition function at the end-point of the interval**  Tursun K. Yuldashev |
| 5:00 – 7:30 PM | **Reception: Banquet Dinner**  **Nā Mea ʻIke ʻIa Cultural Performance with Kumu Brad Lum**  *Location: East-West Center, Makana Room* |

**Day 3: Friday, March 17, 2023**

**Location: Pacific Room, East West Center**

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| 8:30 AM | **Registration & Sign In** |
| **MORNING SESSION 1: Modeling & Data Analytics [9:00 – 10:25 AM]** | |
| 9:00 – 9:30 AM | **Koopman Operator Based Modeling and Control of Quadrotor**  Simone Martini, Kimon P. Valavanis, Alessandro Rizzo |
| 9:30 – 9:55 AM | **On the Vertical and Horizontal Integration of Robotics within Engineering and Computing Education**  Colleen Berg, Missy Cummings, Robert Handler, Monson Hayes, Nathan Kathir, Leigh McCue, Cameron Nowzari, David Rosenblum, Quentin Sanders, Daigo Shishika, John Shortle |
| 9:55 – 10:20 AM | **Vector Thrust Control of an Upper-Stage Rocket with Partially Filled Fuel Tanks via Takagi-Sugeno Fuzzy Model**  Aaron Inks, Chokri Sendi |
| 10.20 – 10.45 AM | **Microwave thermal rocket engine-based orbital launch system implementation.** Abdulazal Toshkhujaev, Akhror Agzamov, Makhsud Yusupov |
| 10:45 – 11:00 AM | **Coffee Break** |
| **MORNING SESSION 2: Nonlinear Control Systems & Machine Learning [10:50 AM – 12:35 PM]** | |
| 11:00 – 11:25 AM | **Data-driven Reinforcement Learning for Mission Engineering and Combat Simulation**  A. Henslee, H. Dozier, I. Shukla, B. Hansen, A. Salhi, T. Arnold, J. Jabour, G. Turner, J. White, I. Dettwiller |
| 11:25 – 11.50 AM | **Optimal control problems for the first order autonomous systems**  Mansur P. Eshov, Najmiddin N. Qodirov, Tursun K. Yuldashev |
| 11:50 – 12:15 PM | **Application of Cybenko’s Theorem and Algebraic Geometry in Solving Modified E-Guidance Equations**  Matthew Leonard, Dilmurat Azimov |
| 12:20 – 12.35 PM | **Coffee Break** |
| **AFTERNOON SESSION 1: Nonlinear Control Systems & Machine Learning [12:35 PM – 1:25 PM]** | |
| 12:35 – 1.00 PM | **A Novel Dynamic & Aerodynamic Intelligent Morphing System (DA-IMS) for the Stability of an Autonomous Utility Truck**  Parth Y. Patel, Vladimir V. Vantsevich, Roy P. Koomulli |
| 1:00 – 1:25 PM | **Analysis of a model for improving the efficiency of routing control in data transmission networks based on fuzzy logic.**  Khojiakbar Urinov. |
| 1:25 – 1:30 PM | **Closing remarks**  Dr. Dilmurat Azimov, *Associate Professor, University of Hawaiʻi at Manoā Department of Mechanical Engineering, IUTAM Symposium Chair* |