

# **2014 International Conference on Unmanned Aircraft Systems**

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**Pages 1-668**



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## ICUAS'14 CONTENT LIST - TECHNICAL PROGRAM

**WEDNESDAY, 28 MAY 2014**

Time: 10:00 AM – 12:30 PM

WeATT1: [UAS Architectures](#)

Room: *Discovery*

Chairs: Calvin Coopmans, Utah State University  
Emerson Marconato, Institute of Mathematics and Computer Science, University of São Paulo

#	Time	Title	Authors
1	10:00-10:25	Architecture Requirements for Ethical, Accurate, and Resilient Unmanned Aerial Personal Remote Sensing 1	Calvin Coopmans
2	10:25-10:50	Architecture and Tools for the Generation of Flight Intent from Mission Intent for a Fleet of Unmanned Aerial Systems 9	Ivan Maza, Jorge Muñoz-Morera, Fernando Caballero, Enrique Casado, Victor Perez-Villar, Anibal Ollero
3	10:50-11:15	LARISSA: Layered Architecture Model for Interconnection of Systems in UAS 20	Emerson Marconato, Daniel Fernando Pigatto, Castelo Branco, Luiz Henrique, Branco Kalinka Regina Lucas Jaquie Castelo Branco
4	11:15-11:40	An Adaptive Trajectory Control for UAV Using a Real-Time Architecture 32	Valeria Artale, Mario Collotta, Cristina Milazzo, Giovanni Pau, Angela Ricciardello
5	11:40-12:05	Data Communication in Linear Wireless Sensor Networks Using Unmanned Aerial Vehicles 43	Imad Jawhar, Nader Mohamed, Jameela Al-Jaroodi
6	12:05-12:30	HAMSTER – Healthy, Mobility and Security-Based Data Communication Architecture for Unmanned Aircraft Systems 52	Daniel Fernando Pigatto, Guilherme Freire Roberto, Leandro Gonçalves, Julio Rodrigues, Alex Sandro Roschildt Pinto, Branco Kalinka Regina Lucas Jaquie Castelo Branco

WeATT2: [UAS Applications – I](#)

Room: *Ponce de Leon I and II*

Chairs: Christian Claudel, KAUST  
Jon Verbeke, KU Leuven

#	Time	Title	Authors
1	10:00-10:25	Optimal Multi-Agent Path Planning for Fast Inverse Modeling in UAV-Based Flood Sensing Applications 64	Mohamed Abdelkader, Mohammad Shaqura, Mehdi Ghommem, Nathan Collier, Victor Calo, Christian Claudel
2	10:25-10:50	Remote Water Sampling Using Flying Robots 72	Marc Schwarzbach, Maximilian Laiacker, Margarita Mulero-Pázmány, Konstantin Kondak
3	10:50-11:15	Using an Unmanned Aircraft to Observe Black Carbon Aerosols During a Prescribed Fire at the RxCADRE Campaign 77	Tara L. Craft, Catherine F. Cahill, Gregory Walker
4	11:15-11:40	Low-Cost Quadrotor Applied for Visual Detection of Landmine-Like Objects 83	Rodriguez Juan, Castiblanco Carolina, Iván Fernando Mondragón Bernal, Julian Colorado
5	11:40-12:05	Optimal Collection of High Resolution Aerial Imagery with Unmanned Aerial Systems 89	Brandon Stark, YangQuan Chen
6	12:05-12:30	Simulation and Platform Tools to Develop Safe Flock of UAVs: A CPS Application-Driven Research 95	Laurent Ciarletta, Adrien Guenard, Yannick Presse, Ye-Qiong Song, Jean-Christophe Ponsart, Samir Aberkane, Didier Theilliol

**WeATT3: UAS Path Planning - I**Room: *Voyage*Chairs: Rajnikant Sharma, Utah State University  
Omer Cetin, Turkish Air Force Academy

#	Time	Title	Authors
1	10:00-10:25	GPGPU Accelerated Real-Time Potential Field Based Formation Control for Unmanned Aerial Vehicles 103	Omer Cetin, Guray Yilmaz
2	10:25-10:50	Optimal Path Tracking Control of a Quadrotor UAV 115	Emre Can Suicmez, Ali Tucker Kutay
3	10:50-11:15	Minimum Time Reference Trajectory Generation for an Autonomous Quadrotor 126	Elie Kahale, Pedro Castillo, Yasmina Bestaoui
4	11:15-11:40	Observability Based Control for Cooperative Localization 134	Rajnikant Sharma
5	11:40-12:05	Routing of Two Unmanned Aerial Vehicles with Communication Constraints 140	Satyanarayana Gupta Manyam, Sivakumar Rathinam, Swaroop Darbha, Phil Chandler, David Casbeer
6	12:05-12:30	Optimal Flight Path Planning for UAVs in 3-D Threat Environment 149	Yaohong Qu, Yintao Zhang, Youmin Zhang

**WeATT4: Fault Tolerant and Energy Aware UAS**Room: *Journey B*Chairs: Youmin Zhang, Concordia University  
Brandon Stark, University of California, Merced

#	Time	Title	Authors
1	10:00-10:25	Active Fault Tolerant Control of Quadrotor UAV Using Sliding Mode Control 156	Abdel-Razzak Merheb, Hassan Noura, François Bateman
2	10:25-10:50	Fault Tolerant Control Using PID Structured Optimal Technique Against Actuator Faults in a Quadrotor UAV 167	Bin Yu, Youmin Zhang, Yaohong Qu
3	10:50-11:15	Embedded Sensors for the Health Monitoring of 3D Printed Unmanned Aerial Systems 175	Brandon Stark, Brennan Stevenson, Kevin Stow-Parker, YangQuan Chen
4	11:15-11:40	A Factor Graph Approach to Estimation and Model Predictive Control on Unmanned Aerial Vehicles 181	Duy-Nguyen Ta, Marin Kobilarov, Frank Dellaert
5	11:40-12:05	Energy-Aware Aerial Vehicle Deployment Via Bipartite Graph Matching 189	Lantao Liu, Nathan Michael
6	12:05-12:30	A Method to Implement and Evaluate a Learning - Based Piloting Autonomous System for UAS 195	Thiago Toshio Matsumoto, Lucio F. Vismari, João Batista Camargo Jr

Time: 15:00 PM – 17:30 PM

**WeBTT1: UAS Swarms - I**

Room: *Discovery*

Chairs: Luis Mejias Alvarez, Queensland University of Technology  
Ting Chen, Queensland University of Technology

#	Time	Title	Authors
1	15:00-15:25	Management of Multiple Heterogeneous UAVs using Capability and Autonomy Visualisation: Theory, Experiment and Result 200	Ting Chen, Luis Felipe Gonzalez, Duncan Campbell, Gilles Coppin
2	15:25-15:50	Towards the Development of 1-to-N Human Machine Interfaces for Unmanned Aerial Vehicles 211	James George Jenner, Luis Mejias Alvarez
3	15:50-16:15	Flocking of Multiple Unmanned Aerial Vehicles by LQR Control 222	Osamah Saif, Isabelle Fantoni, Arturo Zavala-Rio
4	16:15-16:40	Formation Control of Unmanned Aerial Vehicles Based on the Null-Space 229	Claudio Dario Rosales, Mário Sarcinelli-Filho, Gustavo Juan Eduardo Scaglia, Ricardo Carelli
5	16:40-17:05	Decentralized Real Time Implementation of a Leader-Follower Coordination Strategy for Quadrotors 237	José J. Corona-Sanchez, Juan Angel Vargas Jacob, Hugo Rodriguez Cortes

**WeBTT2: UAS Applications - II**

Room: *Ponce de Leon I and II*

Chairs: Pascual Campoy, Univ. Pol. Madrid  
Mohamed, Nader, UAEU

#	Time	Title	Authors
1	15:00-15:25	Quadrotor Control for RF Source Localization and Tracking 244	Jason T. Isaacs, Francois Quitin, Luis Rodolfo Garcia Carrillo, Upamanyu Madhow, Joao P. Hespanha
2	15:25-15:50	How Can Model Driven Development Approaches Improve the Certification Process for UAS? 253	Nicolas Larrieu
3	15:50-16:15	Experiences with Coastal and Aairtime UAS BLOS Operation with Phased-Array Antenna Digital Payload Data Link 261	Vegard Evjen Hovstein, Atle Sæggrov, Tor Arne Johansen
4	16:15-16:40	UAVs for Smart Cities: Opportunities and Challenges 267	Farhan Mohammed, Ahmed Idries, Nader Mohamed, Jameela Al-Jaroodi, Imad Jawhar
5	16:40-17:05	UAV Aerial Imaging Applications for Post-Disaster Assessment, Environmental Management and Infrastructure Development 274	Carlos Alphonso Ezequiel, Matthew Cua, Nathaniel Libatique, Gregory Tangonan, Raphael Alampay, Rollyn Labuguen, Chrisandro Favila, Jaime Luis Honrado, Vinni Carlo Caños, Charles Devaney, Alan Loreto, Jose Bacusmo, Benny Palma
6	17:05-17:30	Towards Autonomous Detection and Tracking of Electric Towers for Aerial Power Line Inspection 284	Carol Martinez, Carlos Sampedro, Aneesh Chauhan, Pascual Campoy

**WeBTT3: UAS Path Planning – II**Room: *Voyage*Chairs: Srikanth Saripalli, Arizona State University  
Israel Lugo Cardenas, CINVESTAV

#	Time	Title	Authors
1	15:00-15:25	Path Planning Using 3D Dubins Curve for Unmanned Aerial Vehicles 296	Yucong Lin, Srikanth Saripalli
2	15:25-15:50	Rapid Trajectory Time Reduction for Unmanned Rotorcraft Navigating in Unknown Terrain 305	Simon Schopferer, Florian Adolf
3	15:50-16:15	RRT-Based Path Planning for Fixed-Wing UAVs with Arrival Time and Approach Direction Constraints 317	Dasol Lee, David Hyunchul Shim
4	16:15-16:40	Vector Field Guidance for Path Following and Arrival Angle Control 329	Seunghan Lim, Wooyoung Jung, Hyochoong Bang
5	16:40-17:05	Dubins Path Generation for a Fixed Wing UAV 339	Israel Lugo Cardenas, Gerardo Ramon Flores Colunga, Sergio Salazar, Rogelio Lozano
6	17:05-17:30	A UAV Path Planning with Parallel ACO Algorithm on CUDA Platform 347	Ugur Cekmez, Mustafa Ozsignan, Ozgur Koray Sahingoz

**WeBTT4: Communication Issues in UAS**Room: *Journey B*Chairs: Matthew Rutherford, University of Denver  
Joao Sousa, University of Porto

#	Time	Title	Authors
1	15:00-15:25	Assessing the Capacity of Man-Portable UAVs for Network Access Point Localization, Using RSSI Link Data 355	Sérgio Ferreira, Guilherme Carvalho, Filipe Ferreira, Joao Sousa
2	15:25-15:50	Collaborative UAVs Cloud 365	Sara Mahmoud, Nader Mohamed
3	15:50-16:15	Unmanned Ground and Aerial Vehicles in Extended Range Indoor and Outdoor Missions 374	Francesco Cocchioni, Valerio Alfonso Pierfelice, Alessandro Benini, Adriano Mancini, Emanuele Frontoni, Primo Zingaretti, Gianluca Ippoliti, Sauro Longhi
4	16:15-16:40	A Mobility Model For UAV Ad Hoc Network 383	Ouns Bouachir, Alinoe Abrassart, Fabien Garcia, Nicolas Larrieu
5	16:40-17:05	Measurement of TCP and UDP Performance Over UAS Relay Network 389	Fumie Ono
6	17:05-17:30	Long-Range Communication Framework for Multi-Agent Autonomous UAVs 395	Elchin Mammadov, Wail Gueaieb

## THURSDAY, 29 MAY 2014

Time: 10:00 AM – 12:30 PM

### ThATT1: UAV Vision Systems and Challenges – I

Room: *Discovery*

Chairs: Pascual Campoy, Univ. Pol. Madrid  
Holger Voos, University of Luxembourg

#	Time	Title	Authors
1	10:00-10:25	On-Board Object Tracking Control of a Quadcopter with Monocular Vision 404	Alex Kendall, Nishaad Salvapantula, Karl Stol
2	10:25-10:50	Vision-Based Qualitative Path-Following Control of Quadrotor Aerial Vehicle 412	Trung Nguyen, George K. I. Mann, Raymond G. Gosine
3	10:50-11:15	Autonomous Navigation, Landing and Recharge of a Quadrotor Using Artificial Vision 418	Francesco Cocchioni, Adriano Mancini, Sauro Longhi
4	11:15-11:40	Morphological Filtering and Target Tracking for Vision-based UAS Sense and Avoid 430	Giancarmine Fasano, Domenico Accardo, Anna Elena Tirri, Antonio Moccia, Ettore De Lellis
5	11:40-12:05	A Ground-Truth Video Dataset for the Development and Evaluation of Vision-based Sense-and-Avoid Systems 441	Adrian Carrio, Changhong Fu, Jesus Pestana Puerta, Pascual Campoy
6	12:05-12:30	Setting Up a Testbed for UAV Vision Based Control Using V-REP & ROS: A Case Study on Aerial Visual Inspection 447	Miguel A. Olivares-Mendez, Somasundar Kannan, Holger Voos

### ThATT2: UAV Modeling and Identification

Room: *Ponce de Leon I and II*

Chairs: Rogelio Lozano, Univ. de Tech. de Compiègne  
Nathan Hoffer, AggieAir, Utah State University

#	Time	Title	Authors
1	10:00-10:25	Aerodynamic Sectional Modeling with the Use of Extended Vectors 459	Ernesto Olguín Díaz, Miguel Angel García Terán
2	10:25-10:50	Modeling and Identification of Electric Propulsion System for Multirotor Unmanned Aerial Vehicle Design 470	Grzegorz Jaroslaw Szafranski, Roman Czyba, Marian Blachuta
3	10:50-11:15	Small Low-Cost Unmanned Aerial Vehicle System Identification: Brief Sensor Survey and Data Quality, Consistency Checking, and Reconstruction 477	Nathan Hoffer, Calvin Coopmans, YangQuan Chen, R. Reese Fullmer
4	11:15-11:40	Dynamic Modeling of a Fixed-Wing VTOL UAV 483	Aslihan Vuruskan, Burak Yuksek, Ugur Ozdemir, Adil Yukselen, Gokhan Inalhan
5	11:40-12:05	Design and Dynamic Modeling of a Rotary Wing Aircraft with Morphing Capabilities 492	Christoph Hintz, Cody Torno, Luis Rodolfo Garcia Carrillo
6	12:05-12:30	Real Time Parameters Identification for a Quad-Rotor Mini-Aircraft using Adaptive Control 499	Jesús Ricardo López, Sergio Salazar, Ivan Gonzalez-Hernandez, Rogelio Lozano

**ThATT3: Multivehicle Cooperation, Health Management and Persistent Operations (Invited Session)**Room: *Voyage*

Chairs: James Morrison, KAIST (Session Organizer)

#	Time	Title	Authors
1	10:00-10:25	Towards Real Time Scheduling for Persistent UAV Service: A Rolling Horizon MILP Approach, RHTA and the STAH Heuristic 506	Byung Duk Song, Jonghoe Kim, James R. Morrison
2	10:25-10:50	Rolling-Horizon Trajectory Planning for Multiple UAVs Based on Pseudospectral Collocation 516	Santiago Vera, Jose Antonio Cobano, Guillermo Heredia, Anibal Ollero
3	10:50-11:15	Integration of Functions within STUAS Operator Crew on Board Royal Netherlands Navy Ships 524	Peter-Paul van Maanen, Bas Holleman, Philip Kerbusch, Rick van der Kleij, Nanja Smets, Selmar Smit, Marleen Rakhorst-Oudendijk
4	11:15-11:40	Multi-objective UAV Routing 534	Lucía Hernández-Hernández, Antonios Tsourdos, Hyo-Sang Shin, Antony Waldock
5	11:40-12:05	The Design and Construction of a High Endurance Hexacopter Suited for Narrow Corridors 543	Jon Verbeke, Dries Hulens, Herman Ramon, Toon Goedemé, Joris De Schutter
6	12:05-12:30	Coordinated Commencement of Pre-Planned Routes for Fixed-Wing UAS Starting from Arbitrary Locations - a Near Real-Time Solution 552	James Keller, Dinesh Thakur, Vladimir Dobrokhodov, Kevin Jones, Maxim Likhachev, Jean Gallier, Isaac Kaminer, Vijay Kumar

**ThATT4: UAS Applications – III**Room: *Journey B*Chairs: Daniel Pack, University of Texas at San Antonio  
Ivan Maza, University of Seville

#	Time	Title	Authors
1	10:00-10:25	Sensor Driven Feedback for Puff Estimation Using Unmanned Aerial Vehicles 562	Liqian Peng, Kamran Mohseni
2	10:25-10:50	An Optimal Sensor Management Technique for Unmanned Aerial Vehicles Tracking Multiple Mobile Ground Targets 570	Negar Farmani, Liang Sun, Daniel Pack
3	10:50-11:15	A New Method for Anomaly Detection and Target Recognition 577	Gurcan Lokman, Guray Yilmaz
4	11:15-11:40	Autonomous Deployment of Swarms of Micro-Aerial Vehicles in Cooperative Surveillance 584	Martin Saska, Jan Chudoba, Libor Preucil, Justin Thomas, Giuseppe Loianno, Adam Tresnak, Vojtech Vonasek, Vijay Kumar
5	11:40-12:05	Towards Distributed Wilderness Search Using Reliable Distributed Storage Device built from a Swarm of Miniature UAVs 596	Paul Antonio Gaynor, Daniel Coore
6	12:05-12:30	The Block-Sharing Strategy for Area Monitoring Missions Using a Decentralized Multi-UAV System 602	Luis Evaristo Caraballo de la Cruz, José Joaquín Acevedo, José-Miguel Díaz-Báñez, B.C. Arrue, Ivan Maza, Anibal Ollero

Time: 15:00 PM – 17:55 PM

ThBTT1: [UAV Vision Systems and Challenges – II](#)

Room: *Discovery*

Chairs: Tor Arne Johansen, Norwegian University of Science and Technology  
Inkyu Sa, Queensland University of Technology

#	Time	Title	Authors
1	15:00-15:25	Localization and Stabilization of Micro Aerial Vehicles Based on Visual Features Tracking 611	Jan Chudoba, Martin Saska, Tomas Baca, Libor Preucil
2	15:25-15:50	A Vision-Based Quadrotor Swarm for the participation in the 2013 International Micro Air Vehicle Competition 617	Jesus Pestana Puerta, Jose Luis Sanchez-Lopez, Paloma de la Puente, Adrian Carrio, Pascual Campoy
3	15:50-16:15	Close-Quarters Quadrotor Flying for a Pole Inspection with Position Based Visual Servoing and High-Speed Vision 623	Inkyu Sa, Peter Corke
4	16:15-16:40	Power Line Detection Using a Circle Based Search with UAV images 632	Alexander Ceron, Iván Fernando Mondragón Bernal, Flavio Prieto
5	16:40-17:05	A System for the Design and Development of Vision-based Multi-robot Quadrotor Swarms 640	Jose Luis Sanchez-Lopez, Jesus Pestana Puerta, Paloma de la Puente, Ramón A. Suárez Fernández, Pascual Campoy
6	17:05-17:30	Online Learning-Based Robust Visual Tracking for Autonomous Landing of Unmanned Aerial Vehicles 649	Changhong Fu, Adrian Carrio, Miguel A. Olivares - Mendez, Pascual Campoy

ThBTT2: [Safety, Privacy and Regulatory Issues in UAS](#)

Room: *Ponce de Leon I and II*

Chairs: John Copley, Garofalo Goerlich Hainbach PC  
Terrence Lance Martin, Queensland University of Technology

#	Time	Title	Authors
1	15:00-15:25	RPAS Integration within an Australian ATM System: What Equipment and which Airspace 656	Terrence Lance Martin, Duncan Campbell
2	15:25-15:50	An Approach to Assess the Safety of ADS-B Based Unmanned Aerial Systems 669	Daniel Baraldi Sesso, Lucio F. Vismari, João Batista Camargo Jr
3	15:50-16:15	FAA Jurisdiction to Regulate UAS Operations below Minimum Altitudes and Outside of Navigable Airspace 677	John Copley
4	16:15-16:40	A Server-Based Real-Time Privacy Protection Scheme against Video Surveillance by Unmanned Aerial Systems 684	Yoochwan Kim, Juyeon Jo, Surendra Shrestha
5	16:40-17:05	Unmanned Aerial Vehicle Security Using Recursive Parameter Estimation 692	Zachary Birnbaum, Andrey Dolgikh, Victor Skormin, Edward O'Brien, Daniel Muller
6	17:05-17:30	Implications for Operator Interactions in an Agent Supervisory Control Relationship 703	Sebastian Clauss, Axel Schulte
7	17:30-17:55	Decision Strategies for Automated Visual Collision Avoidance 715	Aaron McFadyen, Adrien Durand Petiteville, Luis Mejias Alvarez



**ThBTT3: UAS Navigation Techniques**Room: *Voyage*Chairs: Ivan Maza, University of Seville  
Jinqiang Cui, National University of Singapore

#	Time	Title	Authors
1	15:00-15:25	Autonomous Navigation of UAV in Forest 726	Jinqiang Cui, Shupeng Lai, Ben M. Chen, Tong Heng Lee, Xiangxu Dong, Peidong Liu
2	15:25-15:50	On the Safe Navigation Problem for Unmanned Aircraft: Visual Odometry and Alignment Optimizations for UAV Positioning 734	Franz Andert, Nikolaus Ammann, Jan Pueschel, Jörg Dittrich
3	15:50-16:15	A New Approach for Simultaneous UAV Localization And RF Sources Localization (SLAL) 744	Seyyed M. Mehdi Dehghan, Hadi Moradi
4	16:15-16:40	Robust Range-Only SLAM for Aerial Vehicles 750	Felipe R.Fabresse, Fernando Caballero, Ivan Maza, Anibal Ollero
5	16:40-17:05	A Trajectory Tracking and 3D Positioning Controller for the AR.Drone Quadrotor 756	Lucas Vago Santana, Alexandre Santos Brandao, Mário Sarcinelli-Filho, Ricardo Carelli

**ThBTT4: UAS Modeling and Control**Room: *Journey B*Chairs: Franz Andert, German Aerospace Center  
Meyer Nahon, McGill University

#	Time	Title	Authors
1	15:00-15:25	Tailsitter Attitude Control Using Resolved Tilt-Twist 768	Jason M. Beach, Matthew Argyle, Timothy W. McLain, Randal W. Beard, Stephen Morris
2	15:25-15:50	Nonlinear Observers Applied to Fixed-Wing UAVs 780	Ricardo Pavel Parada Morado, Arturo Tadeo Espinoza Fraire, Alejandro Dzul
3	15:50-16:15	Pitch Control of an Oblique Active Tilting Bi-Rotor 791	Charles Blouin, Eric Lanteigne
4	16:15-16:40	The Noise Reduction Techniques for Unmanned Air Vehicles 800	Balemir Uragun, Ibrahim Tansel
5	16:40-17:05	Improvement and Validation of a Propeller Slipstream Model for Small Unmanned Aerial Vehicles 808	Waqas Khan, Meyer Nahon
6	17:05-17:30	Development of Multi-Tentacle Micro Air Vehicle 815	Joe Yeol, Chun-Han Lin

## FRIDAY, 30 MAY 2014

Time: 09:00 – 11:30 AM

### FrATT1: UAS Aerial Manipulation

Room: Discovery

Chairs: Didier Theilliol, University of Lorraine  
Sergio Salazar, CINVESTAV-IPN

#	Time	Title	Authors
1	09:00-09:25	Evaluation of Visual Servoing Control of Aerial Manipulators Using Test Gantry Emulation 821	Todd Danko, Paul Oh
2	09:25-09:50	Multi-UAV Testbed for Aerial Manipulation Applications 830	David Isaias Montufar Aguilar, Filiberto Munoz Palacios, Eduardo Steed Espinoza Quesada, Octavio Garcia Salazar, Sergio Salazar
3	09:50-10:15	Valve Turning Using a Dual-Arm Aerial Manipulator 836	Matko Orsag, Christopher Korpela, Stjepan Bogdan, Paul Oh
4	10:15-10:40	Self Healing Control Method against Unmanned Helicopter Actuator Stuck Faults 842	Xin Qi, Didier Theilliol, Juntong Qi, Youmin Zhang, Jianda Han
5	10:40-11:05	Platform for Quadrotors: Analysis and applications 848	Helosman Figueiredo, Adriano Bittar, Osamu Saotome
6	11:05-11:30	Task-Based Control of a Multirotor Miniature Aerial Vehicle Having an Onboard Manipulator 857	Juan Antonio Escareno Castro, Gerardo Ramon Flores Colunga, Micky Rakotondrabe, Hugo Romero, Rogelio Lozano, Elsa Rubio

### FrATT2: UAS Sensor Fusion

Room: *Ponce de Leon I and II*

Chairs: Pedro Castillo, CINVESTAV - IPN  
Miguel Cordero, FADA-CATEC

#	Time	Title	Authors
1	09:00-09:25	Error Analysis of Algorithms for Camera Rotation Calculation in GPS/IMU/Camera Fusion for UAV Sense and Avoid Systems 864	Tamás Zsedrovits, Peter Bauer, Ákos Zarándy, Balint Vanek, Jozsef Bokor, Tamás Roska
2	09:25-09:50	Survey on Attitude and Heading Reference Systems for Remotely Piloted Aircraft Systems 876	Miguel Cordero, Francisco Alarcón, Antonio Jimenez-Bellido, Antidio Viguria, Anibal Ollero
3	09:50-10:15	Compensation of Magnetometers Error Based on Nonlinear Models for Multimotor Aerial Robots Applications 885	Wojciech Janusz, Roman Czyba, Grzegorz Jaroslaw Szafranski
4	10:15-10:40	Quadrotors Data Fusion Using a Particle Filter 890	Diego Alberto Mercado Ravell, Pedro Castillo, Rogelio Lozano
5	10:40-11:05	Improving Attitude Estimation Using Inertial Sensors for Quadrotor Control Systems 895	Ricardo Sanz Diaz, Luis Ródenas Lorda, Pedro José Garcia Gil, Pedro Castillo

**FrATT3: UAS Control - I**Room: *Voyage*Chairs: Fulvia Quagliotti, Politecnico di Torino  
Meyer Nahon, McGill University

#	Time	Title	Authors
1	09:00-09:25	Controller Development and Validation for a Small Quadrotor with Compensation for Model Variations 902	Chen Wang, Meyer Nahon, Mike Trentini
2	09:25-09:50	Improving the Performance of Aerial Vehicles with Delayed Measures via State Predictor-Control: Experimental Data Validation 910	Angel Gabriel Alatorre Vazquez, Pedro Castillo, Sabine Mondie
3	09:50-10:15	Adaptive Fuzzy Backstepping Control for Trajectory Tracking of Unmanned Aerial Quadrotor 920	Fouad Yacef
4	10:15-10:40	A New Pitch Angle Adaptive Control Design 928	Daniel Viudez-Moreiras, Isaias Martin-Hoyo, Juan M. Martin-Sanchez
5	10:40-11:05	A Learning-Based Fuzzy LQR Control Scheme for Height Control of An Unmanned Quadrotor Helicopter 936	Zhixiang Liu, Chi Yuan, Youmin Zhang, Jun Luo

**FrATT4: Flapping-wing and Jet-propelled UAS**Room: *Journey B*Chairs: João Caetano, Delft University of Technology  
Bin Xu, Northwestern Polytechnical University

#	Time	Title	Authors
1	09:00-09:25	Tethered vs. Free Flight Force Determination of the DelFly II Flapping Wing Micro Air Vehicle 942	João Caetano, Mustafa Percin, Cornelis. C. de Visser, Bas van Oudheusden, Guido de Croon, Bart Remes, Christophe De Wagter, Max Mulder
2	09:25-09:50	Rigid vs. Flapping: The Effects of Kinematic Formulations in Force Determination of a Free Flying Flapping Wing Micro Air Vehicle 949	João Caetano, Maarten Weehuizen, Cornelis. C. de Visser, Guido de Croon, Christophe De Wagter, Bart Remes, Max Mulder
3	09:50-10:15	Neural Dynamic Surface Hypersonic Flight Control Using Minimal-Learning-Parameter Technique 960	Bin Xu, Lin Yu, Shixing Wang, Xiaoqing Feng
4	10:15-10:40	Data Learning Based Hypersonic Flight Control Using ELM 967	Shangmin Zhang, Shixing Wang, Yongquan Zhang, Yu Zhang, Jinrui Ren
5	10:40-11:05	Design and Manufacturing of a High Speed Jet Powered UAV 974	Ender Ozyetis, Nafiz Alemdaroglu

Time: 13:00 – 15:30 PM

FrBTT1: **UAS Testbeds**

Room: *Discovery*

Chairs: Alabares David Lara, Univ. Autonoma de Tamaulipas  
Ugur Ozdemir, Istanbul Technical University

#	Time	Title	Authors
1	13:00-13:25	Formal Intent Based Flight Management System Design for Unmanned Aerial Vehicles 984	Ahmed Farabi Tarhan, Emre Koyuncu, Mehmet Hasanzade, Ugur Ozdemir, Gokhan Inalhan
2	13:25-13:50	Guidance Software-In-The-Loop Simulation Using X-Plane and Simulink for UAVs 993	Adriano Bittar, Helosman Figueiredo, Poliana Avelar Guimaraes, Alessandro Correa Mendes
3	13:50-14:15	Low cost X4 Platform to Study Control Algorithms 1003	Alabazares David Lara, Gerardo Romero, Claude Pegard, Abdelhamid Rabhi, Daniela Flores, Efrain Alcorta, Alejandro Zuñiga, Ramirez Luis
4	14:15-14:40	Configuration Assessment and Preliminary Control Law Design for a Novel Diamond-Shaped UAV 1009	Stanislav Braun, Markus Geiser, Matthias Heller, Florian Holzapfel
5	14:40-15:05	Design and Development of a Semi-Autonomous Fixed-Wing Aircraft with Real-time Video Feed 1021	Cody Torno, Christoph Hintz, Luis Rodolfo Garcia Carrillo
6	15:05-15:30	A Low Cost Prototyping Approach for Design Analysis and Flight Testing of the TURAC VTOL UAV 1029	Yucel Orkut Aktas, Ugur Ozdemir, Yasin Dereli, Ahmed Farabi Tarhan, Aykut Cetin, Aslihan Vuruskan, Burak Yuksek, Hande Cengiz, Serkan Basdemir, Mesut Ucar, Murat Genctav, Adil Yukselen, Ibrahim Ozkol, Metin Orhan Kaya, Gokhan Inalhan

FrBTT2: **Micro and Mini UAS**

Room: *Ponce de Leon I and II*

Chairs: Swee King Phang, National University of Singapore  
Hoam Chung, Monash University

#	Time	Title	Authors
1	13:00-13:25	Obstacle Detection and Navigation Planning for Autonomous Micro Aerial Vehicles 1040	Matthias Nieuwenhuisen, David Droschel, Marius Beul, Sven Behnke
2	13:25-13:50	Explicit Model Identification and Control of a Micro Aerial Vehicle 1048	Swee King Phang, Kun Li, Fei Wang, Ben M. Chen, Tong Heng Lee
3	13:50-14:15	Computational Investigation of Micro Rotorcraft Near-Wall Hovering Aerodynamics 1055	David Conal Robinson, Hoam Chung, Kris Ryan
4	14:15-14:40	Wind Tunnel Testing of a VTOL MAV Propeller in Tilted Operating Mode 1064	Bart Theys, Grigorios Dimitriadis, Thomas Andrianne, Patrick Hendrick, Joris De Schutter
5	14:40-15:05	Propulsion System Model of a Mini UAV System 1073	Serhat Nihat Yanik, Ender Ozyetis, Guclu Ozcan, Nafiz Alemdaroglu, Altan Kayran, Engin Kiran

**FrBTT3: UAS Control – II**Room: *Voyage*Chairs: Kenji Uchiyama, Nihon University  
Alejandro Dzul, Inst. Tecnológico de la Laguna

#	Time	Title	Authors
1	13:00-13:25	Linear Controllers Implementation for a Fixed-Wing MAV 1081	Arturo Tadeo Espinoza Fraire, Ricardo Pavel Parada Morado, Alejandro Dzul, Rogelio Lozano
2	13:25-13:50	Development of Control System for an Unmanned Single Tilt Tri-Rotor Aerial Vehicle 1091	Roman Czyba, Grzegorz Jaroslaw Szafranski, Andrzej Ryś
3	13:50-14:15	Linear Parameter Varying Control Synthesis: State Feedback versus $H^\infty$ Technique with Application to Quadrotor UAV 1099	Iman Sadeghzadeh, Abbas Chamseddine, Didier Theilliol, Youmin Zhang
4	14:15-14:40	Nonlinear Model Predictive Control for a Multi-Rotor with Heavy Slung Load 1105	Jan Trachte, Luis Felipe Gonzalez, Aaron Mcfadyen
5	14:40-15:05	Design of Robust Controller of Fixed-Wing UAV for Transition Flight 1111	Satoshi Kohno, Kenji Uchiyama
6	15:05-15:30	A Flight Control System Design for Highly Unstable Unmanned Combat Aerial Vehicles 1117	Jiwon Jung, Yeondeuk Jung, Dong-II You, David Hyunchul Shim

**FrBTT4: Advances in Rotary Wing UAS**Room: *Journey B*Chairs: Rogelio Lozano, Univ. de Tech. de Compiègne  
Hugo Romero, ICBI - UAEH

#	Time	Title	Authors
1	13:00-13:25	Model-Free Control of a Quadrotor Vehicle 1126	Younes Al Younes, Ahmad Drak, Hassan Noura, Abdelhamid Rabhi, Ahmed El Hajjaji
2	13:25-13:50	Adaptive Control of a Tilt – Roll Rotor Quadrotor UAV 1132	Fatih Senkul, Erdinc Altug
3	13:50-14:15	Discrete Optimal Control for a Quadrotor UAV: Experimental Approach 1138	Omar Santos, Hugo Romero, Sergio Salazar, Rogelio Lozano
4	14:15-14:40	A Hardware-in-loop Platform for Rotary-Wing Unmanned Aerial Vehicles 1146	Igor Pizetta, Alexandre Santos Brandao, Mário Sarcinelli-Filho
5	14:40-15:05	Ground Effect Experiments and Model Validation with Draganflyer X8 Rotorcraft 1158	Inna Sharf, Meyer Nahon, Adam Harmat, Waqas Khan, Matthew Michini, Nicholas Speal, Mike Trentini, Tsviki Tsadok, Tao Wang
6	15:05-15:30	Simulation and Robust Trajectory-Tracking for a Quadrotor UAV 1167	Sergio Salazar, Ivan Gonzalez-Hernandez, Jesús Ricardo López, Rogelio Lozano, Hugo Romero

Time: 16:00 – 18:30 PM

FrCTT1: [UAS Swarms - II](#)

Room: *Discovery*

Chairs: Yu Gu, West Virginia University  
Jesus Capitan, University of Seville

#	Time	Title	Authors
1	16:00-16:25	Control Performance Analysis for Autonomous Close Formation Flight Experiments 1175	Caleb Rice, Yu Gu, Haiyang Chao, Trenton Larrabee, Srikanth Gururajan, Marcello Napolitano, Tanmay Mandal, Matthew Rhudy
2	16:25-16:50	A Multi-Layer Control Scheme for a Centralized UAV Formation 1181	Alexandre Santos Brandao, João Paulo Amorim Barbosa, Valentín Mendoza, Mário Sarcinelli-Filho, Ricardo Carelli
3	16:50-17:15	Event-Based Control Embedded and Networked System: Application to a Mini Quadrotor Helicopter using Motion Capture 1188	Sylvain Durand, Jonathan Dumon, Nicolas Marchand, Jose Fermi Guerrero Castellanos
4	17:15-17:40	Decentralized Cooperation of Multiple UAS for Multi-target Surveillance under Uncertainties 1196	Jesus Capitan, Luis Merino, Anibal Ollero
5	17:40-18:05	Time-Varying Formation Control for Unmanned Aerial Vehicles with Switching Interaction Topologies 1203	Yan Zhou, Xiwang Dong, Geng Lu, Yisheng Zhong

FrCTT2: [UAS Landing Techniques](#)

Room: *Ponce de Leon I and II*

Chairs: Srikanth Saripalli, Arizona State University  
Ella Atkins, University of Michigan

#	Time	Title	Authors
1	16:00-16:25	A Survey of Autonomous Landing Techniques for UAVs 1210	Alvika Gautam, Sujit PB, Srikanth Saripalli
2	16:25-16:50	Automatic Landing of a UAV using Model Predictive Control for the Surveillance of Internal Autopilot's Controls 1219	Juliano Augusto de Bonfim Gripp, Ulisses Pereira Sampaio, Fabio Andrade de Almeida
3	16:50-17:15	Safe Landing Planning for an Energy-Constrained Multicopter 1225	Isaac Olson, Alec Ten Harmsel, Ella Atkins
4	17:15-17:40	Classifying Natural Aerial Scenery for Autonomous Aircraft Emergency Landing 1236	Luis Mejias Alvarez
5	17:40-18:05	Outdoor Autonomous Landing on a Moving Platform for Quadrotors using an Omnidirectional Camera 1243	Jeongwoon Kim, Yeondeuk Jung, Dasol Lee, David Hyunchul Shim

**FrCTT3: UAS Sense and Avoid Technology**Room: *Voyage*Chairs: Luis Mejias Alvarez, Queensland University of Technology  
Marc Schwarzbach, German Aerospace Center (DLR)

#	Time	Title	Authors
1	16:00-16:25	Cooperative Sense and Avoid: Implementation in Simulation and Real World for Small Unmanned Aerial Vehicles 1253	Armin Strobel, Marc Schwarzbach
2	16:25-16:50	Optimal Reciprocal Collision Avoidance with Mobile and Static Obstacles for Multi-UAV Systems 1259	David Alejo, Jose Antonio Cobano, Guillermo Heredia, Anibal Ollero
3	16:50-17:15	Experimental Evaluation of Four Feature Detection Methods for Close Range and Distant Airborne Targets for Unmanned Aircraft Systems Applications 1267	Dan Tulpan, Nabil Belacel, Fazel Famili, Kristopher Ellis
4	17:15-17:40	Collision Detection Using Received Signal Strength in FANETs 1274	Rodolfo Barros Chiaramonte, Branco Kalinka Regina Lucas Jaquie Castelo Branco

**FrCTT4: UAS Payload and Sensor Management**Room: *Journey B*Chairs: Didier Theilliol, University of Lorraine  
Brendan Smith, University of California, Merced

#	Time	Title	Authors
1	16:00-16:25	Aerial Object Tracking from an Airborne Platform 1284	Andreas Nussberger, Helmut Grabner, Luc Van Gool
2	16:25-16:50	Survey of Thermal Infrared Remote Sensing for Unmanned Aerial Systems 1294	Brandon Stark, Brendan Smith, YangQuan Chen
3	16:50-17:15	Smart Sensor Protocol - a New Standard for UAV and Payload Integration 1300	Rayner de Melo Pires, Arthur Avelar Chaves, Branco Kalinka Regina Lucas Jaquie Castelo Branco
4	17:15-17:40	Robust Sensor Fault Diagnosis and Tracking Controller for a UAV Modelled as LPV System 1311	Francisco-Ronay López-Estrada, Jean-Christophe Ponsart, Didier Theilliol, Carlos Astorga-Zaragoza, Youmin Zhang