2013 International Conference on Unmanned Aircraft Systems

(ICUAS 2013)

Atlanta, Georgia, USA
28 - 31 May 2013

Pages 1-591
Content List of 2013 International Conference on Unmanned Aircraft Systems

WeAT1

UAS Applications I (Regular Session)

Buckhead Ballroom

Chair: Claudel, Christian
  KAUST
Co-Chair: Cook, Kevin M. B.
  Brigham Young Univ.

10:00-10:25

  Cook, Kevin M. B.
  Brigham Young Univ.
  Bryan, Everett
  Brigham Young Univ.
  Yu, Huili
  UtopiaCompression Corp.
  Bai, He
  UtopiaCompression Corp.
  Sepp, Kevin
  Brigham Young Univ.
  Beard, Randal W.
  Brigham Young Univ.

10:25-10:50

  Gyongyosi, Andras Zeno
  Eotvos Lorand Univ.
  Kardos, Péter
  Hungarocontrol Hungarian Air Navigation Plc.
  Kurunczi, Rita
  Idokep Ltd.
  Bottyián, Zsolt
  Faculty of Military Sciences and Officer Training, National Uni

10:50-11:15

  Kwon, Hyukseong
  United States Air Force Acad.
  Yoder, Josiah
  United States Air Force Acad.
  Baek, Stanley
  United States Air Force Acad.
  Gruber, Scott
  United States Air Force Acad.
  Pack, Daniel
  Univ. of Texas in San Antonio

11:15-11:40

An UAV Based System for Real Time Flash Flood Monitoring in Desert Environments Using Lagrangian Microsensors, pp. 25-34.
  Abdelkader, Mohamed
  King Abdullah Univ. of Science & Tech. (KAUST)
  Shaqra, Mohammad
  KAUST
  Claudel, Christian
  KAUST
  Gueaieb, Wail
  Univ. of Ottawa

11:40-12:05

Cooperative Source Seeking and Contour Mapping of a Diffusive Signal Field by Formations of Multiple UAVs, pp. 35-40.
  Han, Jinlu
  Utah State Univ.
  Chen, Yangquan
  Univ. of California, Merced

WeAT2

UAS Path Planning I (Regular Session)

Piedmont

Chair: Ho, Tu Dac
  Norwegian Univ. of Science and Tech.
Co-Chair: Zhang, Baochang
  Beihang Univ.

10:00-10:25

  Sahingoz, Ozgur
  Turkish Air Force Acad.

10:25-10:50

  Munoz-Vazquez, Aldo-Jonathan
  Parra-Vega, Vicente
  Sanchez, Anand
  Ramirez Rodriguez, Heriberto
  Centro de Investigación y de Estudios Avanzados del IPN (CINVESTAV)

10:50-11:15

  Ho, Tu Dac
  Norwegian Univ. of Science and Tech.
  Gretti, Esten Ingar
  Norwegian Univ. of Science and Tech.
  Suijti, P. B
  IIIID
  Johansen, Tor Arne
  Norwegian Univ. of Sci. & Tech.
  Sousa, Joao
  Univ. do Porto - Faculdade Engenharia

11:15-11:40

Cooperative and Geometric Learning for Path Planning of UAVs, pp. 69-78.
  Zhang, Baochang
  Beihang Univ.
  Mao, Zhili
  Beihang Univ.
  Liu, Jianzhuang
  chinese Univ. of Hongkong,Shenzhen Key Lab. for CVPR, Shenzhen

11:40-12:05

3D Path Planning for UAVs for Maximum Information Collection, pp. 79-88.
  Ergezer, Halit
  MIKES Inc.
  Leblebicioglu, M. Kemal
  Univ.

12:05-12:30

On the Maneuverability of Small Unmanned Aerial Vehicles, pp. 89-94.
  Andrade de Almeida, Fabio
  Inst. de Aeronáutica e Espaço
  Caminha Escosteguy, João
  Inst. de Aeronáutica e Espaço (IAE)
  Ararpe d'Oliveira, Flávio
  Inst. de Aeronáutica e Espaço

WeAT3

Energy and Control in UAS (Regular Session)

Peachtree

Chair: Coopmans, Cal
  Utah State Univ.
Co-Chair: Zhou, Min
  Georgia Inst. of Tech.

10:00-10:25

Backstepping - Sliding Mode Controllers Applied to a Fixed-Wing UAV, pp. 95-104.
  Espinoza Fraire, Arturo Tadeo
  Inst. Tecnologico de la Laguna
  Dzul, Alejandro
  Inst. Tecnológico de la Laguna
  Lozano, Rogelio
  Univ. de Tech. de Compiègne
  Parada Morado, Ricardo Pavel
  Inst. Tecnologico de la Laguna

10:25-10:50

Battery Model-Based Thrust Controller for a Small, Low Cost
Multirotor Unmanned Aerial Vehicles, pp. 105-113.
Podhradsky, Michal  Utah State Univ.
Coopmans, Cal  Utah State Univ.
Jensen, Austin  Utah State Univ.
10:50-11:15  WeAT3.3
Zhou, Min  Georgia Inst. of Tech.
Prasad, J.V.R.  Georgia Inst. of Tech.
11:15-11:40  WeAT3.4
Leonard, Jeremie  Cranfield Univ.
Savvaris, Al  Cranfield Univ.
Tsourdos, Antonios  Cranfield Univ.
11:40-12:05  WeAT3.5
Hardware-In-The-Loop Simulation of an Attitude Control with Switching Actuators for SUAV, pp. 134-142.
Bittar, Adriano  Inst. Tecnológico de Aeronáutica
Oliveira, Neusa Maria Franco de  Inst. Tecnológico de Aeronáutica
12:05-12:30  WeAT3.6
Gun-Launched Micro Air Vehicle: Concept, Challenges and Results, pp. 143-151.
Roussel, Emmanuel  ISL
Gnemmi, Patrick, Gnemmi  French German Res. Inst. of Patrick
Changey, Sebastien  ISL - French-German Res. Inst. of Saint-Louis
15:00-15:25  WeBT1.1
Cooperative Control of Multiple UAVs for Moving Source Seeking, pp. 193-202.
Zhu, Senqiang  Nanyang Tech. Univ.
Wang, Danwei  Nanyang Tech. Univ.
Low, Chang Boon  DSO National Lab.
15:25-16:15  WeBT1.3
McGarey, Patrick  Arizona State Univ.
Saripalli, Srikanth  Arizona State Univ.
16:15-16:40  WeBT1.4
Ozdemir, Ugur  Istanbul Tech. Univ.
Aktaş, Yücel Orkut  Istanbul Tech. Univ.
Demirbağ, Karaca  Havelsan Inc.
Erdem, Ahmet  Havelsan Inc.
Kalayciogl, Ganim Duygu  Havelsan Inc.
Ozkol, Ibrahim  Istanbul Tech. Univ.
Inalhan, Gokhan  ISTANBUL Tech. Univ.
16:40-17:05  WeBT1.5
A Survey of Unmanned Aerial Vehicles (UAVs) for Traffic Monitoring, pp. 221-234.
Kanistras, Konstantinos  Univ. of Denver
Martins, Goncalo  Univ. of Denver
Rutherford, Matthew  Univ. of Denver
Valavanis, Kimon  Univ. of Denver
17:05-17:30  WeBT1.6
Developing an Unpaved Road Assessment System for Practical Deployment with High-Resolution Optical Data Collection Using a Helicopter UAV, pp. 235-243.
Automatic System for Overhead Power Line Inspection Using an Unmanned Aerial Vehicle, pp. 244-252.

Larrauri, Juan I. Univ. of Deusto

Piedmont


Forsmo, Erik Johannes Norwegian Univ. of Science and Tech.

Grotli, Esten Ingar Norwegian Univ. of Science and Tech.

Fossen, Thor I. Norwegian Univ. of Sci and Tech.

Johansen, Tor Arne Norwegian Univ. of Sci. & Tech.


Ragi, Shankarachary Colorado State Univ.

Chong, Edwin K. P. Colorado State Univ.

GPGPU Accelerated Potential Field Based Autonomous Air Refueling Approach for UAVs, pp. 269-277.

Cetin, Omer Turkish Air Force Acad.

Yilmaz, Guray Computer Engineering Department, Turkish Air Force Acad.


Yang, Shaowu Univ. of Tübingen

Scherer, Sebastian A. Univ. of Tübingen

Schauwecker, Konstantin Univ. of Tübingen

Zell, Andreas Univ. of Tübingen


Leisman, Robert Brigham Young Univ.

McLain, Timothy W. Brigham Young Univ.

Beard, Randal W. Brigham Young Univ.

An Alternative Closed-Loop Vision-Based Control Approach for Unmanned Aircraft Systems with Application to a Quadrotor, pp. 353-358.

Fahimi, Farbod UAHuntsville

Thakur, Karansingh UAHuntsville

Inference of Flight Angles Associating the Flight Images Movement with Camera Parameters, pp. 359-365.

Macena, Milton UFAM

Pio, José UFAM


Mejias Alvarez, Luis Queensland Univ. of Tech.

Fitzgerald, Daniel AeroSys Pty Ltd
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A HIL Testbed for Small Unmanned Helicopter's Initial Controller Gain Tuning, pp. 383-391.
Pourrezaei Khaligh, Sepehr
Martinez, Alejandro
Fahimi, Farbod
Koch, Charles Robert

15:50-16:15 WeBT4.3
Godbolt, Bryan
Vitzilaios, Nikolaos
Bergen, Chris
Lynch, Alan

16:15-16:40 WeBT4.4
Ferrell, Peter
Smith, Brendan
Stark, Brandon
Chen, YangQuan

16:40-17:05 WeBT4.5
Avellar, Gustavo Silva Castilho de
Thums, Gonçalo D.
Lima, Rogério Rodrigues
Iscold, Paulo
Torres, Leonardo
Pereira, Guilherme A. S.
## Technical Program for Thursday May 30, 2013

### ThAT1
#### Advanced Controls in UAS I (Regular Session)
Chair: Wulff, Kai  Ilmenau Univ. of Tech.
Co-Chair: Kim, Seungkeun  Chungnam National Univ.

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<th>Authors</th>
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<tbody>
<tr>
<td>ThAT1.1</td>
<td>Optimal Tracking Control System Design for a Ring-Wing Type UAV</td>
<td>Jeong, Junho  Chungnam National Univ.  Kim, Seungkeun  Chungnam National Univ.  Suk, Jinyoung  Chungnam National Univ.</td>
</tr>
<tr>
<td>ThAT1.2</td>
<td>Integral Sliding Mode Backstepping Control of Quadrotors for Robust Position Tracking</td>
<td>Ramirez Rodriguez, Heriberto  Centro de Investigación y de Estudios Avanzados del IPN (CINVEST)  Parra-Vega, Vicente  CINVESTAV  Sanchez, Anand  CINVESTAV  Garcia Salazar, Octavio  Aerospace Engineering Res. and Innovation Center (CIIIA) - U</td>
</tr>
<tr>
<td>ThAT1.3</td>
<td>Proportional Integral Derivative and Linear Quadratic Regulation of a Multirotor Attitude: Mathematical Modelling, Simulations and Experimental Results</td>
<td>Gargioli, Alessio  Pol. di Torino  Rinaldi, Filippo  Pol. di Torino  Quagliotti, Fulvia  Pol. di Torino</td>
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<tr>
<td>ThAT1.4</td>
<td>Improving Hovering Performance of Tethered Unmanned Helicopters with Nonlinear Control Strategies</td>
<td>Sandino, Luis A.  Univ. of Seville  Bejar, Manuel  Univ. Pablo de Olavide  Kondak, Konstantin  DLR (German Aerospace Center)  Ollero, Anibal  Univ. de Sevilla</td>
</tr>
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<td>ThAT1.5</td>
<td>Experimental Real-Time Validation of an Attitude Nonlinear Controller for the Quadrotor Vehicle</td>
<td>Rodriguez Cortes, Hugo  CINVESTAV-IPN  Corona-Sanchez, José J.  ESIME Atzcapotzalco</td>
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<td>ThAT1.6</td>
<td>Randomized Approaches and Adaptive Control for QuadRotor UAVs</td>
<td>Capello, Elisa  Pol. di Torino  Quagliotti, Fulvia  Pol. di Torino  Tempo, Roberto  Pol. di Torino</td>
</tr>
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### ThAT2
#### UAS Sensor Fusion (Regular Session)
Chair: Jensen, Austin  Utah State Univ.
Co-Chair: Lozano, Rogelio  Univ. de Tech. de Compiègne

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<td>ThAT2.1</td>
<td>Monocular Visual Mapping for Obstacle Avoidance on UAVs</td>
<td>Magree, Daniel  Georgia Inst. of Tech.</td>
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</table>

### ThAT3
#### UAS Fail-Safe Systems (Regular Session)
Chair: Campoy, Pascual  Univ. Pol. Madrid
Co-Chair: Chao, Haiyang  West Virginia Univ.

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<td>ThAT3.4</td>
<td>Basics and Guidelines of Complementary Filters for Small UAS Navigation</td>
<td>Jensen, Austin  Utah State Univ.  Coopmans, Cal  Utah State Univ.  Chen, YangQuan  Univ. of California, Merced</td>
</tr>
<tr>
<td>ThAT3.5</td>
<td>Altitude Estimation for the UAV's Applications Based on Sensors Fusion Algorithm</td>
<td>Szafarski, Grzegorz Jaroslaw  Silesian Univ. of Tech.  Czyba, Roman  Silesian Univ. of Tech.  Janusz, Wojciech  Silesian Univ. of Tech.  Blotnicki, Wojciech  Silesian Univ. of Tech.</td>
</tr>
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### Peachtree
#### UAS Fail-Safe Systems (Regular Session)

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<td>Jensen, Austin  Utah State Univ.  Coopmans, Cal  Utah State Univ.  Chen, YangQuan  Univ. of California, Merced</td>
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</tr>
</tbody>
</table>
### ThAT3.3


- **Fu, Changhong** Pol. Univ. of Madrid
- **Olivares-Mendez, Miguel A.** Univ. Pol. de Madrid, Computer Vision Group
- **Campoy, Pascual** Univ. Pol. Madrid
- **Suárez Fernández, Ramón A.** Univ. Pol. de Madrid

**11:15-11:40 ThAT3.4**


- **Coombes, Matthew** Loughborough Univ.
- **Chen, Wen-Hua** Loughborough Univ.

**11:40-12:05 ThAT3.5**


- **Cen, Zhao-hui** UAE Univ.
- **Noua, Hassan** United Arab Emirates Univ.
- **Al Younes, Younes** Higher Coll. of Tech.

### ThAT4

**UAS Control Architectures (Regular Session)**

**Chair:** Ollero, Anibal
**Co-Chair:** Coopmans, Cal

**10:00-10:25 ThAT4.1**


- **Pestana Puerta, Jesus** Computer Vision Group, Centre for Automation and Robotics, CSIC-
- **Mellado-Bataller, Ignacio** Pol. Univ. of Madrid
- **Sanchez-Lopez, Jose Luis** CSIC - Univ. Pol. de Madrid, Centro de Automatica y
- **Fu, Changhong** Pol. Univ. of Madrid
- **Mondragón B., Iván F.** Pontificia Univ. Javeriana
- **Campoy, Pascual** Univ. Pol. Madrid

**10:25-10:50 ThAT4.2**

**Decentralized Strategy to Ensure Information Propagation in Area Monitoring Missions with a Team of UAVs under Limited Communications (I)**, pp. 565-574.

- **Acevedo, José Joaquin** Univ. de Sevilla
- **Arrue, B.C.** Escuela Superior de Ingenieros, Univ. de Sevilla
- **Diaz-Báñez, José-Miguel** Univ. of Seville
- **Ventura, Inmaculada** Dpto. Matemática Aplicada II, Univ. de Sevilla.
- **Maza, Ivan** Univ. de Sevilla
- **Ollero, Anibal** Univ. de Sevilla

**10:50-11:15 ThAT4.3**

**Framework for Autonomous Onboard Navigation with the AR.Drone**, pp. 575-583.

- **Jimenez, Jacobo** Univ. of Tübingen
- **Zell, Andreas** Univ. of Tübingen

### ThAT4.4


- **Guerrero Castellanos, Jose** Autonomous Univ. of Puebla (BUAP),
- **Téllez Guzmán, José Juan** Autonomous Univ. of Puebla (BUAP)
- **Durand, Sylvain** CNRS - CInVESTAV
- **Marchand, Nicolas** CNRS-Gipsa-Lab.
- **Alvarez Muñoz, Jonatan Uziel** Autonomous Univ. of Puebla (BUAP)

**11:40-12:05 ThAT4.5**


- **Catena, Antonino** Univ. di Catania
- **Melita, Carmelo Donato** Univ. degli Studi di Catania
- **Muscato, Giovanni** Univ. degli Studi di Catania

### ThBT1

**Advanced Controls in UAS II (Regular Session)**

**Chair:** Quagliotti, Fulvia
**Co-Chair:** Chen, YangQuan

**15:00-15:25 ThBT1.1**

**Fractional Order Controller for Pitch Loop Control of a VTOL UAV**, pp. 609-614.

- **Han, Jinlu** Utah State Univ.
- **Di, Long** Univ. of Virginia
- **Coopmans, Cal** Utah State Univ.
- **Chen, YangQuan** Univ. of California, Merced

**15:25-16:15 ThBT1.2**


- **Liu, Hao** Tsinghua Univ.
- **Hou, Xiaolei** Australian National Univ.
- **Kim, Jonghyuk** The Australian National Univ.
- **Zhong, Yisheng** Tsinghua Univ.

**16:15-16:40 ThBT1.3**

**Controller Design for Small Air Vehicles — an Overview and Comparison**, pp. 621-627.

- **Cui, Yinan** Univ. of Louisville
- **Inanc, Tamer** Univ. of Louisville

**16:40-17:00 ThBT1.4**

**State-Feedback Control of the SpaceHawk Earth-Based Lunar Hopper**, pp. 628-633.

- **Dzaba, Anthony** Lehigh Univ.
- **Abraham, Andrew** Lehigh Univ.
A Static Feedback Stabilizer for the Longitudinal Dynamics of a Small Scale Helicopter Including the Rotor Dynamics with Stabilizer Bar, pp. 634-641.

Benítez-Morales, José Centro de Investigación y Estudios Avanzados
Rodríguez Cortés, Hugo CINVESTAV-IPN
Castro-Linares, Rafael CINVESTAV-IPN

Rate Control and Flight Stabilization for a Quadrotor System, pp. 642-649.

Jahn, Benjamin TU Ilmenau
Barth, Alexander TU Ilmenau
Wulff, Kai Ilmenau Univ. of Tech.
Simon, Tobias TU Ilmenau
Römisch, Jan TU Ilmenau

Real-Time Altitude Robust Controller for a Quad-Rotor Aircraft Using Sliding-Mode Control Technique, pp. 650-659.

Gonzalez, Ivan Cinvestav - IPN
Salazar, Sergio UMI LAFMIA CINVESTAV
Lozano, Rogelio Univ. de Tech. de Compiègne
Escareno Castro, Juan Antonio FEMTO-ST Inst.


Aguilar-Sierra, Hipolito CINVESTAV-IPN
Flores Colunga, Gerardo Ramon
Salazar, Sergio UMI LAFMIA CINVESTAV
Lozano, Rogelio Univ. de Tech. de Compiègne

Improvement of Power Efficiency in Flapping-Wing MAVs through a Semi-Passive Motion Control Approach, pp. 734-743.

Mahjoubi, Hosein Univ. of California Santa Barbara
Byl, Katie UC Santa Barbara

Micro Helicopter-Airplane System: Trajectory Tracking and Attitude Control, pp. 744-753.

Espinoza Quesada, Eduardo Steed
Lugo-Cardenas, Israel CINVESTAV
Garza Salazar, Octavio Aerospace Engineering Res. and Innovation Center (CIIA) - U
Malo Tamayo, Alejandro Justo Centro de Investigación y de Estudios Avanzados del IPN
Lozano, Rogelio Univ. de Tech. de Compiègne

Small Scale UAV with Birotor Configuration, pp. 761-768.
Gonçalves, Fernando Silvano Federal Univ. of Santa Catarina
Bodanese, João Paulo Federal Univ. of Santa Catarina
Donadel, Rodrigo Federal Univ. of Santa Catarina
Raffo, Guilherme Vianna Univ. of Seville
Normey-Rico, Julio Elias Federal Univ. of Santa Catarina
Buss Becker, Leandro Federal Univ. of Santa Catarina

Shin, HeeMin Korea Advanced Inst. of Science and Tech.
You, Dong-Il Korea Advanced Inst. of Science and Tech.
Shim, David Hyunchul Korea Advanced Inst. of Science and Tech.

Transition Flight Control of the Quad-Tilting Rotor Convertible MAV, pp. 789-794.
Flores Colunga, Gerardo Ramon Univ. of Tech. of Compiègne
Lozano, Rogelio Univ. de Tech. de Compiègne
Romero, Hugo ICBI - UAEH

Munoz Hernandez, Laura Elena Univ. de Tech. de Compiègne, Heudiasyc Lab.
Castillo, Pedro Univ. De Tech. De Compiègne
Garcia Gil, Pedro José Univ. Pol. de Valencia

An Impedance Force Control Approach to a Quad-Rotor System, pp. 805-810.
Jung, Seul Chungnam National Univ.

A New Concept of VTOL As Fixed-Wing, pp. 811-817.
Technical Program for Friday May 31, 2013

FrAT1 | Buckhead Ballroom
Cooperative Control Designs for Multiple Aerial Vehicles (Invited Session)
Chair: Zhang, Youmin Concordia Univ.
Co-Chair: Tsourdos, Antonios Cranfield Univ.
Organizer: Zhang, Youmin Concordia Univ.
Organizer: Zhou, Donghua Tsinghua Univ.
Organizer: Jiang, Bin NUAA

10:00-10:25 FrAT1.1
Cooperative Localization Based on the Azimuth Angles among Multiple UAVs (I), pp. 818-823.
Qu, Yaohong Northwestern Polytechnical Univ.
Wu, Jizhi Northwestern Polytechnical Univ.
Zhang, Youmin Concordia Univ.

10:25-10:50 FrAT1.2
De La Torre, Gerardo Georgia Inst. of Tech.
Yucelen, Tansel UAV Res. Facility, School of Aerospace Engineering, Georgia Tech.
Johnson, Eric N. Georgia Inst. of Tech.

10:50-11:15 FrAT1.3
Saska, Martin Czech Tech. Univ. in Prague
Krajnik, Tomas Faculty of Electrical Engineering, Czech Tech. Univ.
Vonasek, Vojtech Czech Tech. Univ. in Prague, Faculty of electrical engi
Vaněk, Petr Czech Tech. Univ. in Prague
Preuclí, Libor Czech Tech. Univ.

11:15-11:40 FrAT1.4
Shi, Jietao Tsinghua Univ.
He, Xiaow Tsinghua Univ.
Wang, Zidong Brunel Univ.
Zhou, Donghua Tsinghua Univ.

11:40-12:05 FrAT1.5
A Solution for the Goal Position Assignment in Formation Problem, pp. 850-858.
Garcia Delgado, Luis Arturo Univ. de Sonora
Gomez, Roberto Univ. de Sonora
Garcia, Alejandro Univ. de Sonora
Leal, Ana Univ. de Sonora
Berman, Dainet Univ. de Sonora
Vera, Alicia Univ. de Sonora
Rojas, Armando Univ. de Sonora

12:05-12:30 FrAT1.6
Sadraya, Mohammad Daniel Webster Coll.

FrAT2 | Piedmont
Model Identification of UAS (Regular Session)
Chair: Castillo, Pedro Univ. De Tech. De Compiegne
Co-Chair: Pack, Daniel Univ. of Texas in San Antonio

10:00-10:25 FrAT2.1
Wind Estimation for Accurate Airplane Path Following Applications, pp. 869-874.
Brezoescu, Alexandru Cornel Univ. of Tech. of Compiegne
Castillo, Pedro Univ. De Tech. De Compiegne
Lozano, Rogelio Univ. de Tech. de Compiegne

10:25-10:50 FrAT2.2
Parameter Estimation Based Control of Hypersonic Aircraft with Magnitude Constraints on States and Actuators, pp. 875-880.
Xu, Bin Northwestern Pol. Univ.
Wang, Shixing Tsinghua Univ.
Gao, Daoxiang Beijing Forestry Univ.

10:50-11:15 FrAT2.3
Identification of Directional Runway Dynamics for an Experimental UAV, pp. 881-889.
Drago, Igor do Nascimento Flight Tech.
Maciel, Benedito Flight Tech. S/A
Hemerly, Elder Inst. Tecnologico De Aeronautica
Andrade de Almeida, Fabio Inst. de Aeronáutica e Espaco

11:15-11:40 FrAT2.4
Physical Input Modelling and Identification for a Helicopter UAV, pp. 890-896.
Godbolt, Bryan Univ. of Alberta
Lynch, Alan U Alberta

11:40-12:05 FrAT2.5
Hoffer, Nathan Center for Self-Organizing Systems (CSOIS), Utah State Univ.
Coopmans, Cal Utah State Univ.
Jensen, Austin Utah State Univ.
Chen, YangQuan Univ. of California, Merced

12:05-12:30 FrAT2.6
Abdel-Hafez, Mamoun American Univ. of Sharjah

FrAT3 | Peachtree
Multivehicle Cooperation, Health Management and Persistent Operations (Invited Session)
Chair: Morrison, James R. KAIST
Co-Chair: Stark, Brandon Univ. of California, Merced
Organizer: Morrison, James R. KAIST

10:00-10:25 FrAT3.1
Persistent UAV Service: An Improved Scheduling Formulation and Prototypes of System Components (I), pp. 915-925.
Song, Byung Duk KAIST, Department of Industrial and Systems Engineering
Kim, Jonghwan KAIST, Department of Industrial and Systems Engineering
Kim, Jeongwoon KAIST
Park, Hyorin KAIST, Department of Industrial and Systems Engineering
Morrison, James R. KAIST
Shim, David Hyunchul Korea Advanced Inst. of Science and Tech.

10:25-10:50 FrAT3.2
Modeling Multiple Unmanned Aerial Vehicles Placement Problem in Ad Hoc Network Via Quadratic Unconstrained Binary Optimization (I), pp. 926-932.
Wang, Haibo Texas A&M International Univ.
Wang, Wei Texas A&M International Univ.
Huang, Jun Texas A&M International Univ.
Xu, Yaquan Texas A&M International Univ.
Huo, Da Central Univ. of Finance and Econ. Beijing

10:50-11:15 FrAT3.3
Mobile Networking with UAVs: Opportunities and Challenges, pp. 933-941.
Sahingoz, Ozgur Koray Turkish Air Force Acad.

11:15-11:40 FrAT3.4
On the Concerted Design and Scheduling of Multiple Resources for Persistent UAV Operations (I), pp. 942-951.
Kim, Jonghoe KAIST, Department of Industrial and Systems Engineering
Morrison, James R. KAIST

11:40-12:05 FrAT3.5
Persistent Visitation under Revisit Constraints (I), pp. 952-957.
Las Fargeas, Jonathan Univ. of Michigan
Hyun, Baro Univ. of Michigan
Kabamba, Pierre T. Univ. of Michigan
Girard, Anouck Univ. of Michigan at Ann Arbor

FrAT4 Veranda
Aerial Manipulation (Regular Session)
Chair: Danko, Todd Drexel Univ.
Co-Chair: Lozano, Rogelio Univ. de Tech. de Compiègne

10:00-10:25 FrAT4.1
Trajectory Control of a Class of Articulated Aerial Robots, pp. 958-965.
Kobilarov, Marin Johns Hopkins Univ.

10:25-10:50 FrAT4.2
Lyapunov Based Model Reference Adaptive Control for Aerial Manipulation, pp. 966-973.
Orsag, Matko Univ. of Zagreb
Korpela, Christopher Drexel Univ.
Bogdan, Stjepan Univ. of Zagreb
Oh, Paul Drexel Univ.

10:50-11:15 FrAT4.3
A Hyper-Redundant Manipulator for Mobile Manipulating Unmanned Aerial Vehicles, pp. 974-981.
Danko, Todd Drexel Univ.
Oh, Paul Drexel Univ.

11:15-11:40 FrAT4.4
A Hardware-In-The-Loop Test Rig for Aerial Manipulation, pp. 982-987.
Korpela, Christopher Drexel Univ.
Orsag, Matko Univ. of Zagreb, Faculty of Electrical Engineering and Compu

FrBT1 Buckhead Ballroom
UAS Control Related Challenges (Regular Session)
Chair: Lozano, Rogelio Univ. de Tech. de Compiègne
Co-Chair: Chao, Haiyang West Virginia Univ.

15:00-15:25 FrBT1.1
Neural Control for Longitudinal Dynamics of Hypersonic Aircraft, pp. 988-993.
Xu, Bin Northwestern Pol. Univ.
Shi, Zhongke Northwestern Pol. Univ.
Wang, Danwei Nanyang Tech. Univ.
Wang, Han Nanyang Tech. Univ.
Zhu, Senqiang Nanyang Tech. Univ.

15:25-15:50 FrBT1.2
Guidelines for Integration of Autonomous UAS in Global ATM, pp. 994-1003.
Gimenes, Ricardo Univ. of Sao Paulo
Correa, Mario A. Univ. of Sao Paulo
Camargo Jr, João Batista Univ. of Sao Paulo
Avelino, Valter F. Univ. of Sao Paulo
Vismari, Lucio F. Univ. of Sao Paulo
Cugnasca, Paulo Sérgio Univ. of Sao Paulo
Rossi, Magali A. Univ. of Sao Paulo
Almeida Jr, Jorge Rady Univ. of Sao Paulo

15:50-16:15 FrBT1.3
Castaneda, Herman Univ. Autonoma de Nuevo Leon
Salas, Oscar Univ. Autonoma de Nuevo Leon
De Leon, Jesus Univ. Autonoma de Nuevo Leon

16:40-17:05 FrBT1.5
A Nonlinear Path-Following Strategy for a Fixed-Wing MAV, pp. 1014-1024.
Flores Colunga, Gerardo Univ. of Tech. de Compiègne
Ramon Lugo-Cardenas, Israel CINVESTAV
Lozano, Rogelio Univ. de Tech. de Compiègne

17:05-17:30 FrBT1.6
Bank to Turn Approach for Airplane Translational Motion in Unknown Wind, pp. 1022-1029.
Brezoescu, Alexandru Cornel Univ. of Tech. of Compiègne
Lozano, Rogelio Univ. de Tech. de Compiègne
Castillo, Pedro Univ. De Tech. De Compiègne

FrBT2 Piedmont
UAS Modeling and Control (Regular Session)
Chair: Restas, Agoston National Univ. of Public Service
Co-Chair: Claudel, Christian KAUST

15:00-15:25 FrBT2.1
Some Aspect of Human Features of the Use of Unmanned Aerial Systems in a Disaster-Specific Division, pp. 1030-1036.
Restas, Agoston National Univ. of Public Service
Dudas, Zoltan  
National Univ. of Public Service  
15:25-15:50  
FrBT2.2  

Gao, Daoxiang  
Beijing Forestry Univ.  
Wang, Shixing  
Department of Computer Science and Tech. Tsinghua Univ.  
Lu, Dumin  
Beijing Forestry Univ.  
15:50-16:15  
FrBT2.3  

Alaimo, Andrea  
Univ. of Enna Kore  
Artale, Valeria  
Univ. of Enna Kore  
Milazzo, Cristina  
Univ. of Enna Kore  
Ricciardello, Angela  
Univ. of Enna Kore  
Trefilletti, Luca  
Univ. of Enna Kore  
16:15-17:05  
FrBT2.4  
Middleware Requirements for Collaborative Unmanned Aerial Vehicles, pp. 1051-1060.

Mohamed, Nader  
UAEU  
Al-Jaroodi, Jameela  
Middleware Tech. Lab.  
Jawhar, Imad  
UAEU  
Lazarova-Molnar, Sanja  
UAEU  
17:05-17:30  
FrBT2.5  
Observer-Based Adaptive Super Twisting Control Strategy for a 2-DOF Helicopter, pp. 1061-1070.

Salas, Oscar  
Univ. Autonoma de Nuevo Leon  
Castaneda, Herman  
Univ. Autonoma de Nuevo Leon  
De Leon, Jesus  
Univ. Autonoma de Nuevo Leon  
17:30-17:55  
FrBT2.6  
Modeling and Control of a Novel Tilt – Roll Rotor Quadrotor UAV, pp. 1071-1076.

Senkul, Fath  
Istanbul Tech. Univ.  
Altug, Erdinc  
Istanbul Tech. Univ.  
18:00-18:25  
FrBT2.7  

Li, Kun  
National Univ. of Singapore  
Phang, Swee King  
National Univ. of Singapore  
Chen, Ben M.  
National Univ. of Singapore  
Lee, Tong Heng  
National Univ. of Singapore  
18:30-19:15  
FrBT3  
Fault-Tolerant Designs for Multiple Aerial Vehicles  
(Invited Session)

Chair: Zhang, Youmin  
Concordia Univ.  
Co-Chair: Stark, Brandon  
Univ. of California, Merced  
Organizer: Zhang, Youmin  
Concordia Univ.  
Organizer: Zhou, Donghua  
Tsinghua Univ.  
Organizer: Jiang, Bin  
NUAA  
19:00-19:30  
FrBT3.1  

Zhang, Youmin  
Concordia Univ.  
Mehdijerdi, Hasan  
Quebec Univ.  
19:30-20:15  
FrBT3.2  

Xu, Qing  
Nanjing Univ. of Aeronautics and Astronautics  
Yang, Hao  
Nanjing Univ. of Aeronautics and Astronautics  
Jiang, Bin  
NUAA  
Zhou, Donghua  
Tsinghua Univ.  
Zhang, Youmin  
Concordia Univ.  
20:15-20:55  
FrBT3.3  

Tancredi, Daniele  
MathWorks  
Gu, Yu  
West Virginia Univ.  
Chao, Haiyang  
West Virginia Univ.  
20:55-21:40  
FrBT3.4  
A Literature Review on Fault Diagnosis Methods for Manned and Unmanned Helicopters (I), pp. 1114-1118.

Qi, Xin  
Univ. of Chinese Acad. of Sciences  
Theilliol, Didier  
Univ. of Lorraine  
Qi, Juntong  
Shenyang Inst. of Automation, CAS  
Zhang, Youmin  
Concordia Univ.  
Han, Jianda  
Shenyang Inst. of Automation  
21:40-22:30  
FrBT3.5  
Coverage Control in Multi-Vehicle Systems Subject to Health Degradation (I), pp. 1119-1124.

Sharif, Farid  
Concordia Univ.  
Zhang, Youmin  
Concordia Univ.  
Aghdam, Amir G.  
Concordia Univ.  
22:30-23:15  
FrBT3.6  

Ure, Nazim Kemal  
Massachusetts Inst. of Tech.  
Chowdhary, Girish  
Massachusetts Inst. of Tech.  
Chen, Yu Fan  
Massachusetts Inst. of Tech.  
Cutler, Mark  
Massachusetts Inst. of Tech.  
How, Jonathan P.  
Massachusetts Inst. of Tech.  
Vian, John  
Boeing Res. and Tech.  
23:15-24:00  
FrBT4  
Vision & Sensing for Localization of UAVs and Their Targets  
(Invited Session)

Chair: Morrison, James R.  
KAIST  
Co-Chair: Lozano, Rogelio  
Univ. de Tech. de Compiengne  
Organizer: Morrison, James R.  
KAIST  
15:00-15:25  
FrBT4.1  
Stability Analysis of a Vision-Based UAV Controller for Autonomous Road Following Missions (I), pp. 1135-1143.

Ramirez, Adrian  
CINVESTAV  
Esponoza Quesada, Eduardo  
Univ. Pol. de Pachuca Steed  
Garcia Carrillo, Luis Rodolfo  
Univ. of California, Santa Barbara  
Mondie, Sabine  
CINVESTAV-IPN  
Lozano, Rogelio  
Univ. de Tech. de Compiengne  
15:25-15:50  
FrBT4.2  
Tracking Tagged Fish with Swarming Unmanned Aerial Vehicles

Jensen, Austin Utah State Univ.
Chen, YangQuan Univ. of California, Merced

15:50-16:15 FrBT4.3

A Vision and GPS-Based Real-Time Trajectory Planning for MAV in Unknown Urban Environments (I), pp. 1150-1155.

Flores Colunga, Gerardo Univ. of Tech. of Compiègne
Ramon
Zhou, Shuting Univ. of Tech. of Compiegne
Lozano, Rogelio Univ. de Tech. de Compiegne
Castillo, Pedro Univ. De Tech. De Compiegne

16:40-17:05 FrBT4.5


Cutler, Mark Massachusetts Inst. of Tech.
Michini, Buddy MIT
How, Jonathan P. Massachusetts Inst. of Tech.

17:05-17:30 FrBT4.6

A Vision-Based Target Tracking Control System of a Quadrotor by Using a Tablet Computer (I), pp. 1165-1172.

Kim, Jeongwoon KAIST
Shim, David Hyunchul Korea Advanced Inst. of Science and Tech.