

# International Micro Air Vehicle Conference and Competition

## IMAV2013 Program

### Tuesday, September 17th

8h30 – 9h : Conference registration

9h – 9h20 : ENAC Welcome

9h20 – 10h35 : Scientific Session 1: *Aerodynamics and propulsion performances*

- Murat Bronz, Gautier Hattenberger and Jean-Marc Moschetta. *Development of a Long Endurance Mini-UAV : ETERNITY*
- Klaus-Peter Prof. Dr.-Ing. Neitzke. *Rotary Wing Micro Air Vehicle Endurance*
- Peng Lv, Sebastien Prothin, Fazila Mohd-Zawawi, Emmanuel Benard, Joseph Morlier and Jean-Marc Moschetta. *Adaptive proprotors as applied to convertible MAVs*

► *for all visitors/competitors : presentation of the Outdoor competition place and security rules*

10h35 – 10h55 : Coffee break

10h55 – 12h10 : Scientific Session 2: *Vision and image processing*

- Johannes Schellen, Christian Dernehl and Stefan Kowalewski. *Optimizing Image Processing on OMAP3 with driver-level frame buffering and color space conversion*
- Guido De Croon, Hann Woei Ho, Christophe De Wagter, Erik-Jan van Kampen, Bart Remes and Qiping Chu. *Optic-flow based slope estimation for autonomous landing*
- Laurie Bose and Arthur Richards. *MAV Belief Space Planning In 3D Environments With Visual Bearing Observations*

12h10 – 13h50 : Lunch / Poster session

13h50 – 15h20 : Keynotes lecture and Round table about RPAS Integration in the Airspace

15h20 – 16h20 : Technical Sessions 1 and 2

Technical 1: *Rotors and propellers*

- Sergey Serokhvostov. *One idea of propeller for low Reynolds numbers*
- Zhen Liu, Longlei Dong, Jean-Marc Moschetta and Jianping Zhao. *Nano Rotor Blade Airfoil Optimization*
- Matthew Anderson, Kc Wong and Patrick Hendrick. *Propeller Location Optimisation for Annular Wing Design*

Technical 2: *Mission for MAVs*

- Vincent Van Geirt and Renaud Kiefer. *Endurance UAV glider for topography application*
- Christian Eschmann, Jochen Kurz and Christian Boller. *CURe MODERN – Franco-German Infrastructure Inspection with Unmanned Air Systems*
- Gautier Hattenberger, Grégoire Cayez and Greg Roberts. *Flight tests for meteorological studies with MAV*

16h20 – 16h40 : Coffee break

16h40 – 18h : Technical Sessions 3 and 4

#### Technical 3: *Aerodynamics*

- Sergey Serokhvostov, Kirill Shilov and Nikita Pushchin. *MAV unsteady characteristics in-flight measurement with the help of SmartAP autopilot*
- Warakorn Hlusriyakul, Chanchai Pattanathummasid, Chinnapat Thipyopas and Chanin Tongchitpakdee. *Aerodynamic Investigation and Analysis of Wingtip Thickness's Effect on Low Aspect Ratio Wing*
- Kwanchai Chinwicharnam, David Gomez Ariza, Jean-Marc Moschetta and Chinnapat Thipyopas. *Aerodynamic Characteristics of a Low Aspect Ratio Wing and Propeller Interaction for a Tilt-Body MAV*
- C.-H. Kuo, C.-M. Kuo, A. Leber and C. Boller. *Vector thrust multi-rotor copter and its application for building inspection*

#### Technical 4: *Vision*

- Kirill Shilov, Vladimir Afanasyev and Pavel Samsonov. *Vision-based Navigation Solution for Autonomous Indoor Obstacle Avoidance Flight*
- Andrew Nolan, Daniel Serrano, Aura Hernandez, Daniel Ponsa and Antonio Lopez. *Obstacle mapping module for quadrotors on outdoor Search and Rescue operations*
- Jose Luis Sanchez-Lopez, Alberto Moreno, Jesus Pestana and Pascual Campoy. *Visual Quadrotor Swarm for IMAV 2013 Indoor Competition*
- Johanna Matthaei, Thomas Krüger, Stefan Nowak and Ulf Bestmann. *Swarm Exploration of Unknown Areas on Mars Using SLAM*

► for all competitors : presentation of the Indoor and Outdoor competition rules

### **Wednesday, September 18th**

9h30 – 12h30 : Outdoor competition (Buses from ENAC at 8h45)

12h30 – 13h30 : Lunch

13h30 – 19h : Outdoor competition

### **Thursday, September 19th**

9h – 13h : Indoor competition

13h – 14h30 : Lunch

14h30 – 15h30 : Technical Sessions 5 and 6

#### Technical 5: *Structure / Flapping wing*

- Guillaume Bavoux, Baptiste Delannoy, Benoit Wach and Renaud Kiefer. *Development of a Quadrotor based on an Innovative Composite Shape with Carbon and Kevlar Structure*
- S Deng, B.W. van Oudheusden, B. Remes, R. Ruijsink and H Bijl. *Experimental Study of “Delfly Micro” in Forward Flight*
- Johannes Goosen, Hugo Peters and Qi Wang. *Resonance Based Flapping Wing Micro Air Vehicle*

#### Technical 6: *System, navigation and control*

- Montserrat Manubens, Didier Devaurs, Lluís Ros and Juan Cortés. *A motion planning approach to 6-D manipulation with aerial towed-cable systems*
- Karl Kufieta and Prof. Vörsmann. *First flight experiments with a RT-Linux autocode environment including a navigation filter and a spline controller*
- Bart Remes, Dino Hensen, Christophe De Wagter, Erik van der Horst and Guido De Croon. *Paparazzi open source autopilot adapted for use with the Parrot AR drone*

17h : Social event at Airbus (bus will leave from Enac)

## Friday, September 20th

9h – 10h15 : Scientific Session 3: *Flapping wing MAVs*

- Matej Karasek, Iulian Romanescu and Andre Preumont. *Pitch Moment Generation and Measurement in a Robotic Hummingbird*
- João Caetano, Jochem Verboom, Coen de Visser, Guido de Croon, Bart Remes, Christophe de Wagter and Max Mulder. *Near-Hover Flapping Wing MAV Aerodynamic Modelling - a linear model approach*
- Qi Wang, Hans Goosen and Fred Van Keulen. *Optimal hovering kinematics with respect to various flapping wing shapes*

10h15 – 10h35 : Coffee break

10h35 – 11h15 : Keynote lecture (US Army)

11h15 – 12h30 : Scientific Session 4: *MAV systems, navigation and control*

- Jan Bolting, Francois Defay and Jean-Marc Moschetta. *Differential GPS for small UAS using consumer-grade single-frequency receivers*
- Murat Bronz, Jean Philippe Condomines and Gautier Hattenberger. *Development of an 18cm Micro Air Vehicle : QUARK*
- Guangying Jiang and Richard Voyles. *Hexrotor UAV Platform Enabling Dexterous Aerial Mobile Manipulation*

12h30 – 13h45 : Lunch

13h45 – 14h30 : Post-flight Session

Competing teams will be allowed to present to the public their flights and what they achieved during the competition

14h30 – 15h : Awards ceremony and final words

# PLAN de L'ENAC

