BARDIENUS PIETER DUISTERHOF

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PERSONAL STATEMENT

Motivated and experienced student in the field of autonomous aerial robots. Keen to contribute to the field by enabling the next generation of fully autonomous robots. My interest lies in applying hardware-software co-design to execute expensive algorithms within strict resource constraints.

PUBLICATIONS

2019 **'Learning to Seek: Autonomous Source Seeking on a Nano Drone Microcontroller with Deep Reinforcement Learning'** , **Bardienus P. Duisterhof**, Srivatsan Krishnan, Jonathan J. Cruz, Colby R. Banbury, William Fu, Aleksandra Faust, Guido C. H. E. de Croon, Vijay Janapa Reddi – *Under Review*

2019 **'A Tailless Flapping Wing MAV Performing Monocular Visual Servoing Tasks'**, D.A. Olejnik, **B.P. Duisterhof**, M. Karásek, K.Y.W. Scheper, T. van Dijk and G.C.H.E. de Croon – *IMAV 2019*

2019 **'The Role of Compute in Autonomous Aerial Vehicles'** , Behzad Boroujerdian, Hasan Genc, Srivatsan Krishnan, **Bardienus Pieter Duisterhof**, Brian Plancher, Kayvan Mansoorshahi, Marcelino Almeida, Wenzhi Cui, Aleksandra Faust, Vijay Janapa Reddi – *Under Review*

2018 **'Autonomous landing algorithm using a sun position predicting model for extended use of solar powered UAVs'** , **B.P. Duisterhof** & G.C.H.E. de Croon – *IMAV 2018*

AWARDS

- IMAV 2019: Nominated for best paper award.
- IMAV 2018: 3rd prize and innovation award in indoor competition with DelFly Nimble.

BLOGS AND MAGAZINES

- Bitcraze guest blog: 'Learning to Seek'.
- Leonardo Times: 'Extending UAV Range'. 5,500 copies distributed.

EXPERIENCE

Harvard Edge Computing, Cambridge, MA *May - Dec 2019*
Visiting Research Fellow

- Source seeking project: using Deep-RL onboard a nano drone to find a light source.
- Currently working on multi-agent source seeking with a swarm of nano drones.

Micro Air Vehicle Labratory (MAVLab), Delft, Netherlands *Jul 2016 - May 2019*
Student Researcher

- Won **innovation award** in the 2018 **IMAV competition** by implementing computer vision algorithms on a 30-gram flapping-wing drone (DelFly Nimble). Line-following, ellipse detection and obstacle avoidance with **extremely limited resources**. Responsible for computer vision.
- Published a first-author paper in the 2018 IMAV conference, and a second-author paper in the 2019 IMAV conference.

European Space Agency (ESA), Delft, Netherlands *Mar - Jul 2018*
Design Synthesis Exercise
Vehicle Control System Lead

- Designed an experimental orbital re-entry vehicle for the European Space Agency. Vehicle design included, but was not limited to, thermal design, orbital trajectory and control system design.
- Responsible for the control subsystem. Designed a **controller** for re-entry at constant mach number (M=10).

EDUCATION

Delft University of Technology, Delft, Netherlands *Sept 2018 – Jul 2020*
MSc Control and Simulation, Aerospace Engineering – GPA 8.2/10

- Coursework in computer vision, control theory, flight dynamics, human-machine interaction and autonomous systems.
- Expected graduation: July 2020.

Georgia Institute of Technology, Atlanta, GA *Aug - Dec 2017*
Exchange Student, Computer Science and Mechanical Engineering – GPA 4.0/4.0

- Exchange semester at Georgia Tech, coursework in algorithm design, robotics, computer vision, mobile and ubiquitous computing.

Delft University of Technology, Delft, Netherlands *Sept 2016 – Jul 2018*
TU Delft Honors Student
Selected for the highly competitive TU Delft Honors Program

- Courses: took additional courses in design thinking, meeting and conference skills.
- Research: undergraduate researcher in the MAVLab from sophomore year.

Delft University of Technology, Delft, Netherlands *Sept 2015 – Jul 2018*
BSc Aerospace Engineering, GPA 8.5/10 – Top 8% – Cum Laude (with honors)

- Top-ranked program in Aerospace Engineering, featuring a wide range of courses in aerospace engineering, computer science and mechanical engineering.
- Courses in aircraft design, control design, computational modelling, advanced flight dynamics.

SKILLS

Languages Python, C, C++, MatLab
Frameworks Tensorflow,TFLite, Keras, Stable Baselines, Keras-RL, Paparazzi AutoPilot, ROS, OpenCV

EXTRA-CURRICULAR

Athletics
Swimmer in national and international competitions, selected for the 2020 TU Delft Iron Man team.
Sailing Instructor
Certified sailing instructor, teaching children and adults practical and theoretical sailing skills.
Committees
Part of a study tour committee, organizing a study-trip to Tokyo. Also took part in a symposium committee to organise the annual TU Delft Aerospace Honors Symposium.