BARDIENUS PIETER DUISTERHOF

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PUBLICATIONS

2020 **'Learning to Seek: Tiny Robot Learning (tinyRL) for Source Seeking on a Nano Quadcopter'** , **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 at ICRA 2021*

2019 **'Real-Time Machine Learning on Tiny Autonomous Machines'** , **Bardienus P. Duisterhof**, Srivatsan Krishnan, Jonathan J. Cruz, Colby R. Banbury, William Fu, Aleksandra Faust, Guido C. H. E. de Croon, Vijay Janapa Reddi – *Proceedings of the 2nd SysML Conference - On-device Intelligence Workshop*, Palo Alto, CA, USA, 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 at Transactions on Computer Systems (TOCS)*

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 – *11th International Micro Air Vehicle (IMAV) Competition and Conference, Unmanned Systems Journal 2020*

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 – *10th International Micro Air Vehicle (IMAV) Competition and Conference*

EXPERIENCE

Selfly, Delft, the Netherlands *Jan 2020 - Present*
Software Engineer

- Developed cost-effective and reliable augmented reality (AR) systems for the aviation industry, with the goal to improve overall safety.
- Developed minimum viable product with AR goggles and NVIDIA TX2 for VIO.

Delft University of Technology, Delft, the Netherlands *Jul 2016 - Present*
Undergraduate/Graduate Student

- **M.Sc. thesis** on evolutionary robotics for collaborative gas seeking with a swarm of nano quadcopters. Designed the full stack: hardware, software, simulator, algorithm.
  Graded: 9.5/10.0.
- **Teaching assistant** in Aerospace Systems & Control Theory. Supported undergraduate students in help sessions and developed Python learning tools, enhancing distance learning.
- Head of acquisition Tokyo Study Tour, budget €30,000. Negotiated sponsorship with large companies, like EY, and achieved competitive ticket pricing with airlines suchs as KLM.
- Organized Honors Symposium, budget €5,000.

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

- Developed a **fully autonomous RL-powered nano quadcopter**. Studied various machine learning techniques for deployment under stringent resource constraints.
- Implemented a DQN **Deep Reinforcement Learning policy** onboard a CrazyFlie, demonstrating robust light seeking and obstacle avoidance through hardware-software co-design.

European Space Agency (ESA), Delft, the Netherlands *Mar - Jul 2018*
Design Synthesis Exercise

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

AWARDS

- IMAV Conference 2019: **Best paper award nominee**, top 6 papers.
- **IMAV 2018 Autonomous Drone Race**: 3rd prize and innovation award in indoor competition with DelFly Nimble. Unlocked visual servoing on a 30-gram flapping wing MAV.

EDUCATION

Delft University of Technology, Delft, the Netherlands *Sept 2018 – Dec 2020*
M.Sc. Control and Simulation, Aerospace Engineering - GPA 8.8/10.0 Cum Laude (i.e., with distinction)

- Coursework in computer vision, control theory, flight dynamics, human-machine interaction and autonomous systems.

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, the Netherlands *Sept 2016 – Jul 2018*
TU Delft Honors Student
Selected for the 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*
B.Sc. Aerospace Engineering - GPA 8.4/10, Cum Laude (i.e., with distinction)

- 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 and flight dynamics.

SKILLS

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

EXTRA-CURRICULAR

Athletics
Competitive swimmer in national and international competitions.

Sailing Instructor
Certified sailing instructor, teaching children and adults practical and theoretical sailing skills.

Volunteering
Personally raised €3,116.35 for children with muscle diseases, by swimming across a channel in the ocean.