

# Digital Twin of an electric DragonFly Airplane

Development of a Digital Twin bridging the physical and virtual world for the electric DragonFly airplane.

---

The Aeronautical Engineering department at Inholland University of Applied Sciences in Delft embarks on a project to get a Viking Dragonfly mk.II in the air. The goal is to utilise new technologies which currently are still in development by the industry to significantly lower the emission for aviation.

***“Project DragonFly is completing the build of an existing Viking DragonFly mk.II while transforming the airplane into a cleaner, quieter and smarter solution.”***

The Dragonfly was given the Outstanding New Design Award at the EAA Convention in 1980 [1]. This airplane features a tandem wing layout and is mainly constructed from composites.

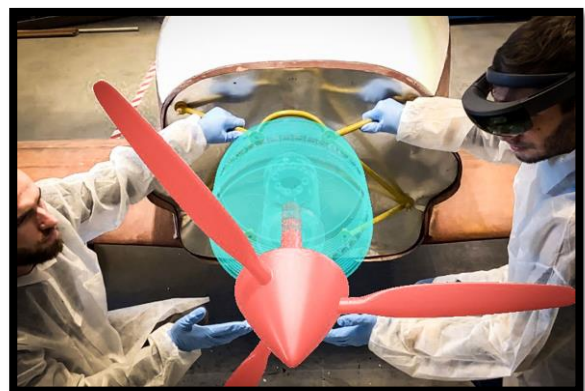
For more information about Project DragonFly, visit <http://projectdragonfly.nl>.



## Project description

The next step in the roadmap is starting a research program for developing a Digital Twin of the electric DragonFly airplane bridging the physical and virtual world. The Digital Twin provides smarter solutions to potentially be smarter and more efficient in the iterative process of design, build and test products such as airplanes. This will vary from real-time simulations to Mixed Reality applications and advanced simulators.

The first steps using the Digital Twin is to assess the performance and flight behaviour of the DragonFly. These parameters are needed to analyse the airplane its structural integrity and determine the flight distance using electric propulsion. The manufacturer provides information about the design and manufacturing process of this airplane, however less about its flight behaviour and performance. Hence, numerical analyses and simulators are needed to asses these parameters.



Parallel to this research, the feasibility of implementing Digital Twin applications into the Aeronautical Engineering Programme will be assessed (from year one to four).

The following research activities are expected:

- Perform a literature study on the state of the art regarding the technique of Digital Twin;
- Develop a Digital Twin to bridge the physical and virtual world for the electric DragonFly airplane;
- Determine performance characteristics and flight behaviour of the DragonFly using a theoretical approach and compare this to analysis using the Digital Twin.

### **Company information**

Inholland Composites, located at Inholland in Delft and Alkmaar, is a very well equipped, high-tech laboratory in the field of composite materials and structures. The focus is on fibre reinforced plastics which provide durable and lightweight solutions in a wide range of applications. In addition, Inholland Composites is spreading their wings to contribute to a sustainable aviation being cleaner, quieter and smarter. It is our mission to put theory into practice and provide students with up-to-date education which connects to today's business.

Would you like to join forces and contribute to a sustainable aviation? Sent your application (motivation and CV) to [mark.ommert@inholland.nl](mailto:mark.ommert@inholland.nl).

Internship period: February 2020 / June 2020

Assignment written by: Mark Ommert

Checked by: Arnold Koetje