Doing your Master thesis at NLR

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- General Information
- Master Project Option 1: Machine Learning for opponents in Air-Air combat
- Master Project Option 2: Human Interaction with Dr. One
NLR is the national knowledge center for aerospace.

Its mission is to increase the sustainability, safety and efficiency of air transport.
Then and now

Then:

- Successor of Rijksstudiedienst voor de Luchtvaart, established in 1919
- A non-profit, independent foundation since 1937
Then and now

Now:

- One of the four “Large Technological Institutes” in the Netherlands
- 680 employees
- Makes important scientific and technological contributions to aerospace activities in- and outside of the Netherlands
Locations

NLR - Amsterdam

NLR - Flevoland

NLR - Dedicated to innovation in aerospace
Research facilities

Airplanes

Laboratories

Simulators

Wind tunnels

NLR - Dedicated to innovation in aerospace
Fighter 4-Ship
Using Machine Learning to discover good weights for a Situation Awareness model

Using Neuro-Evolution to alter the topology of a Situation Awareness model

Graph-Based Model

Neural Network

Using Genetic Programming to optimize a rule base for air-to-air combat behavior
Opening: Evolutionary Dynamic Scripting +

- We want to continue the work on Evolutionary Dynamic Scripting:
  - Faster and more effective way of adapting behavior rules

- We are looking for a student with:
  - Java programming skills (or a related language but willing to learn Java)
  - An interest in simulation and machine learning

- Goal: scientific publication
Covering the last mile in health service delivery

Master Thesis Option 2
Access to quality health care is a human right. Within developing countries, the areas of greatest need are overwhelmingly rural. Of the one billion people living in extreme poverty, 75% do not live in cities.

Lack of transport and cost of transport are important reasons why people do not use health care services. Health care services are often not accessed by the very poor and by women in particular.

In 2005, only 580,066 km or 22.7% of the total African road network was paved. The expectations are that road infrastructure will remain seriously hampered for the coming 50 years.

Timely transportation services for medical goods are crucial for quality health care. The World Health Organization estimates that 75% of maternal deaths can be prevented through timely access to child-birth related care.
Dr. One Concept

Realizing a Unmanned Aircraft System (UAS) for last mile medical transport:

Dr. One is developed to:
- Operate safely and autonomously
- Operate from unprepared locations
- Allow for ease of control

Long term robust solution with local focus
- Low cost, local manufacturing
- Low cost, local operations
- Low cost, local maintenance

Stimulate local economy, local job creation
Transportation of small medical goods through the air

Dr. One end-user Health worker Akua is at the health post, and requires supplies to be brought in by Dr. One. Through an app she asks the Dr. One transportation provider to do so. She checks for a safe landing.

Transportation provider
Operator Tano operates and maintains Dr. One systems. He prepares the system before each operation and authorizes take-off.

Transition to vertical landing

Time

District hospital

Health Post (CHPS)
Opening: Dr. One

- We want to develop a low Control Station with which nurses can launch and land Dr. One:
  - Concept
  - Model
  - Prototype

- We are looking for a student who is able to develop the control concept, to model and prototype the control station

- Goal: demonstration of a prototype of the control station
Let me know!

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