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NWTF AI-Enabled Wind Tunnel Forum

Georgios Rigas and Sean Symon
14/09/2026

This room does not usually exist

Why today matters

100+

attendees

20

companies

21

universities

**Airbus · Boeing · JLR · Williams · Aston Martin · Alpine · Cadillac · Prometheus · PhysicsX · Neural Concept · ATI · ONERA ·
Catesby · TotalSim · LaVision · Hendon · Numerta · AeroDynamiQ · British Cycling**

**Imperial · Southampton · Cambridge · Oxford · Manchester · Bristol · Birmingham · Bath · Surrey · Loughborough · Edinburgh ·
Coventry · City St George's · UWE · TU Delft · Carlos III Madrid · METU · NYU Abu Dhabi**

It is the reason to be ambitious about what comes next.

The UK already made the hard investment

The National Wind Tunnel Facility

23 facilities across 13 universities, run as one distributed national capability

£23M infrastructure award, 11 new facilities, transformational equipment at six universities

Built on a deliberate choice: compete as a nation, not as institutions

Open to industry and academia. Training/Forum events

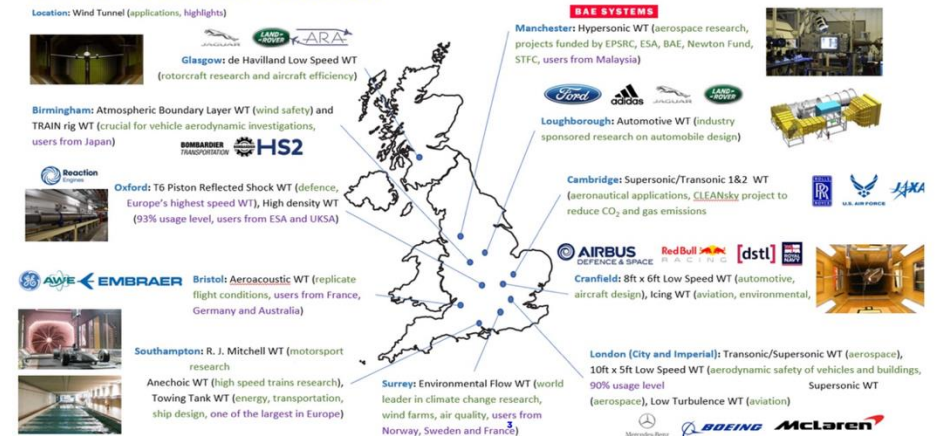
Free access to Early Career Researchers (Academia)

Experimental database for everyone



www.nwtf.ac.uk

NWTF Current Facilities



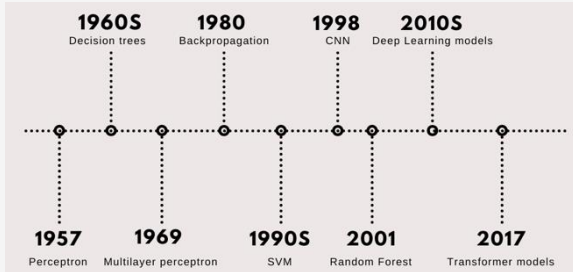
The infrastructure is in place. What sits on top of it is the open question.

Where AI has got to

The landscape

Learning from data

Perceptron 1957, backpropagation 1980, deep learning 2010s, transformers 2017. Hopfield and Hinton, Nobel Prize in Physics 2024.



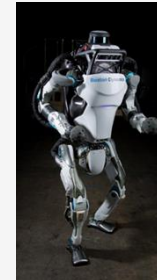
Learning to decide

DQN 2015, AlphaGo, AlphaFold and the Nobel Prize in Chemistry 2024, AlphaEvolve. Agents that find strategies nobody wrote down.



Act in the physical world

Robotics, autonomous vehicles, weather. The frontier has moved from predicting the world to acting in it.



Every step of that arc happened in simulation, in software, or in a game.

AI learned to play in simulation

Physics and the shift

Simulation-first

- Cheap (not for physics!), parallel, unlimited episodes
- AlphaGo, AlphaFold, and now for engineering design
- Enormous capital moving into it
- But the model is the world, and the model eventually breaks



Experiment-first

- The physical world is the environment
- No modelling error, no sim-to-real gap
- Turbulence, unsteadiness and noise come for free
- Access to complex flows but partially measurable

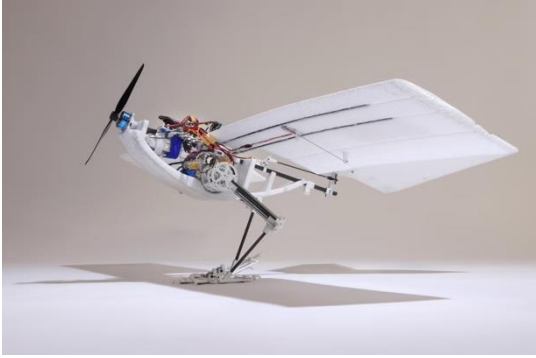
Nobody has yet treated a physical facility as a learning environment at scale.

Nobody has yet synced a physical facility and simulations at scale.

The wind tunnel stops being a measurement device and becomes a training environment.

It already works

Three proofs that learning in the loop is real



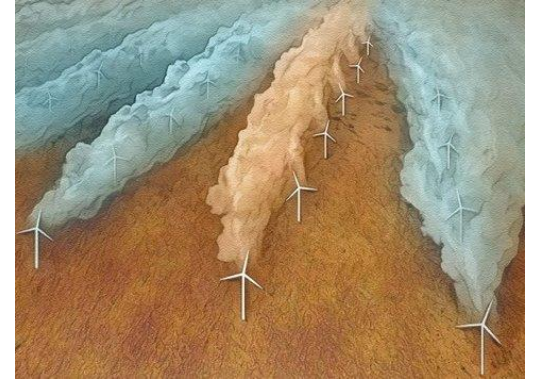
Robots that learn to fly

Flapping-flight platform in the tunnel, learning control policies from real flow rather than from a model of it.



Vehicles that change shape

Adaptive aerodynamic surfaces finding their own optimum in closed loop during a run.



Wind farms that steer wakes

Learned wake control raising array power, moving from tunnel to field.

Three physical systems, one loop: sense, decide, actuate, learn. You will see more of it all day, from Southampton, Bath, Delft, Madrid and Ankara.

Why the UK, and why now

The window

The infrastructure

A national network of 23 facilities, recently recapitalised, that no single company could build.

The expertise

The number of people who can close a learning loop on a real physical system is small, and many are in this room.

The capital

Frontier labs and industrial AI companies are actively looking for the physical world. They are in this audience.

The tailwind

Somebody will do this. The question is whether it is done here.

Panel discussion, 14:05

What should the next generation of AI-enabled experimental facilities look like?

**Bharath
Ganapathisubramani**

Incoming Chair,
National Wind Tunnel Facility

**University of
Southampton**

Anna Perry

Lead Wind Tunnel
Methodology Engineer

Williams F1

Jon Paton

Managing Director

Catesby Projects

Harry Simpson

Senior Technologist,
Aerodynamics

**Aerospace Technology
Institute**

Nick Simmonds

Principal Simulation
Engineer

PhysicsX

Moderated by Georgios Rigas · CAGB 300 · 40 minutes · questions from the floor from 14:30

What I would like from today

Three questions for the room, the panel and the close

1

What would you actually do with an autonomous facility?

Not what is interesting. What would change in your programme next year.

2

What stops you today?

Sensing, latency, data, validation, skills or trust.

3

What would you only build together?

The things no company or university will fund alone are the ones worth organising around.

The panel at 14:05 and the closing discussion at 16:50 are built around these.

The day ahead

- 09:45 Measurement and flow reconstruction
- 11:10 Intelligent experiments and digital twins
- 12:15 Poster flash talks
- 12:35 Lunch and poster expo
- 14:05 Panel discussion
- 14:45 Engineering discovery and control
- 16:10 Physical AI and autonomy
- 16:50 Open discussion and close

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Over to the science

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Where we go next

Four things, starting this week

A write-up, within a week

I will summarise, and send it to everyone who was in this room today. Feedback would be welcome.

A small committee

A handful of people from NWTF, industry and academia to turn today into something coherent. If you want to be on it, find me before you leave or reply to the write-up.

A white paper

Jointly authored across NWTF, industry and academia. What AI-enabled experimentation needs, what only a national network can provide, and what it would take to build. Your name on it if you want it there.

Keep talking

Bilateral conversations start now. Whatever you would only build together, tell me and I will try to find the others who said the same thing.

None of this works without you in it. That is the whole point.