



2024 Amelia Earhart Fellow

Elise Özalp



Citizenship: Germany and France

Proposed Program: Aeronautics at Imperial College London, United Kingdom

Elise Özalp is a Ph.D. student in aeronautics at Imperial College London, focusing on physics-aware machine-learning for fluid dynamics. Her research, as part of the EU-funded PhyCo project, centers on developing physics-constrained adaptive learning techniques for multi-physics optimization. The utilization of machine-learning methods holds great potential to reduce the computational cost for simulating turbulent flows at fine scales.

Ms. Özalp's focus is studying the internal dynamics of recurrent neural networks for time-series forecasting of turbulent flows. Her work contributes to the mathematical basis for constraining these methods such that they reproduce the governing Navier-Stokes equations and the turbulent, chaotic nature of fluids. Her research has two main goals: reconstructing high-resolution measurements from partial observations and demonstrating the capability of recurrent neural networks to reproduce and infer complex chaotic stability properties.

Before starting her Ph.D., Ms. Özalp earned a Master of Science in computational mathematics from Technische Universität Darmstadt, Germany. She contributed to R&D research and development software development at Dassault Systèmes, where she focused on accelerating computations for electromagnetic simulations in radar systems using compressed sensing.

Parallel to her research, Ms. Özalp serves as a Ph.D. representative in her department and teaches undergraduate students the foundations of artificial intelligence for aerospace engineering. Outside of her research interests, she enjoys outdoor sports and is an avid baker.