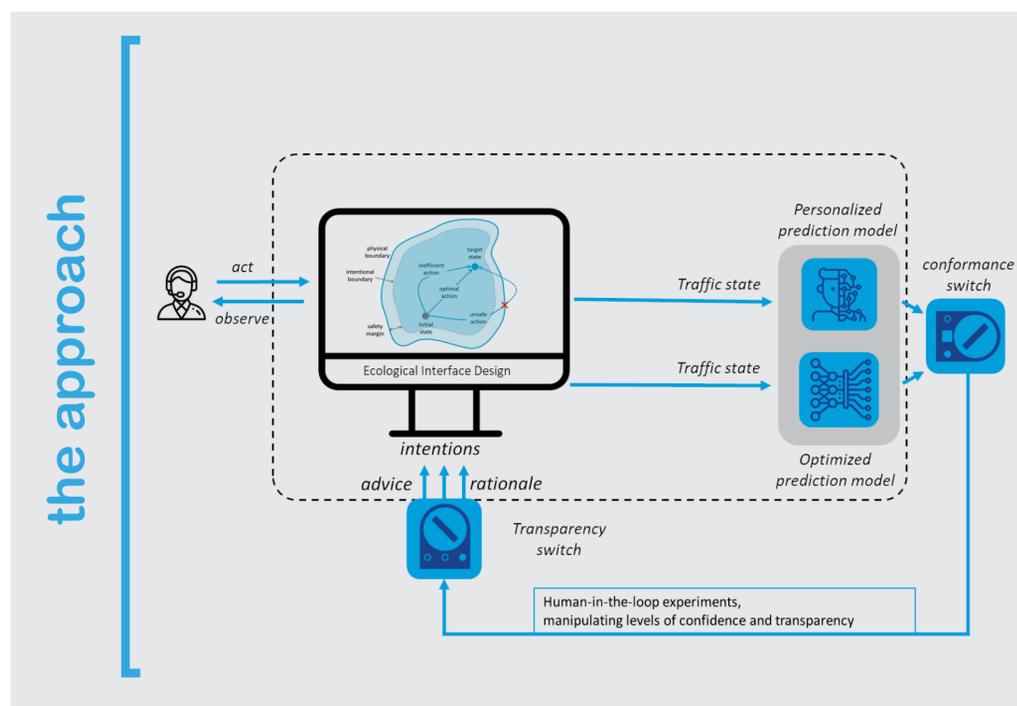


Balancing Transparency and Conformance of an AI Conflict Detection and Resolution Support System.

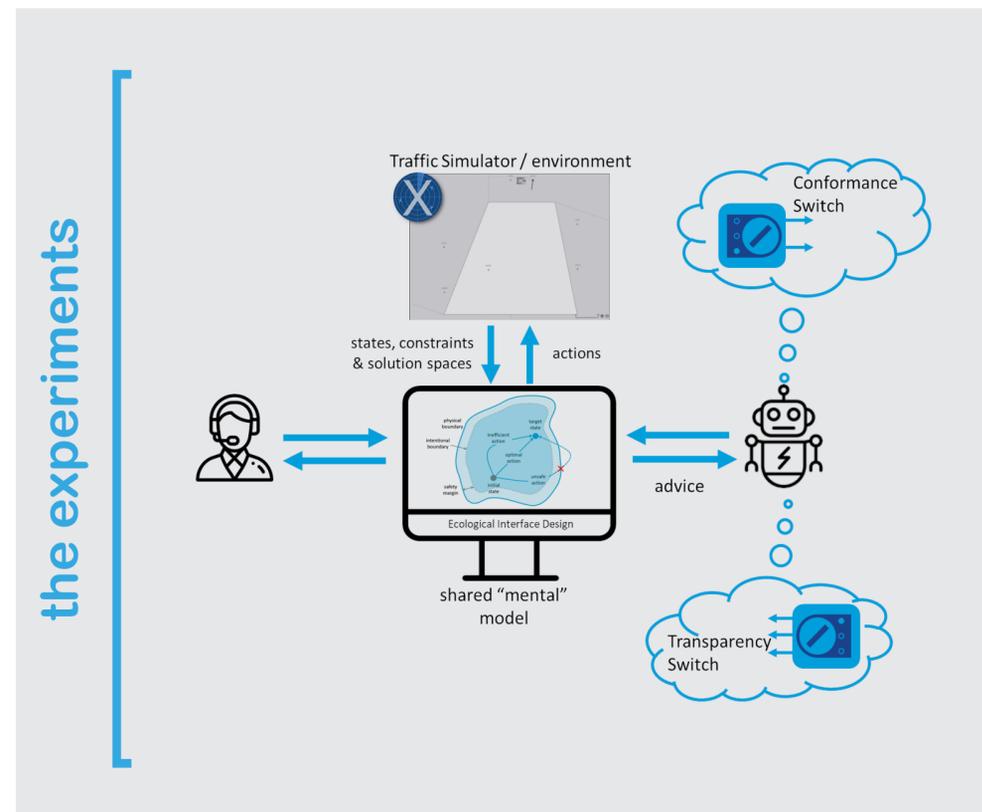
In the emerging age of artificial intelligence in ATM, MAHALO asks two simple but profound questions:

Should we design automation that is strategic conformal (i.e. adapts to the individual)? or **should we design automation that is transparent and explains itself to the human?** Do we need both?



To balance the degree of conformance and transparency, we propose a hybrid AI approach that combines model-driven (e.g., rule-based expert systems) and data-driven (e.g. neural nets) applications. Such system could strive for optimal performance while accommodating individual differences. By knowing the individual's preferences, the system can provide transparency by explaining both why it suggests another solution and why this solution is considered to be better.

The first activity consisted of a literature review to determine the state of the art in AI approaches for CD&R. For MAHALO, the most desirable method for conflict resolution is likely to be a combination of a supervised learning algorithm together with a reinforcement learning algorithm.



18 papers exploring AI methods for CD&R within last 5 years



MAHALO focuses on conflict advisory (or decision support) automation, capable of providing the controller real-time assistance with CD&R. Thereto, MAHALO will develop an AI agent capable of detecting and resolving conflicts. The future reference environment is in line with the digital European sky vision 2040 (i.e. phase D in the digital transformation) in the European ATM Master plan.



This project has received funding from the SESAR Joint Undertaking (JU) under grant agreement No 892970. The JU receives support from the European Union's Horizon 2020 research and innovation programme and the SESAR JU members other than the Union. The opinions expressed herein reflect the author's view only.

Carl Westin
Linköping University, Sweden
carl.westin@liu.se

Stefano Bonelli
Deep Blue, Italy
stefano.bonelli@dblue.it

Tiago Monteiro Nunes
Delft University of Technology, the Netherlands
t.m.monteironunes@tudelft.nl

Clark Borst
Delft University of Technology, the Netherlands
c.borst@tudelft.nl



10th SESAR Innovation Days



founding members

