AI for Air Traffic Management and Large Scale Urban Mobility

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17 novembre 2023

People

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Pr Nicolas Couellan (ENAC)

Pr Emmanuel Rachelson (ISAE)

Chair Topics

- AI for ground segment automation (Air Traffic Management)
- AI for on board decision support tools (SPO)
- AI for unmanned aircraft system traffic management (UTM)
- AI in infinite dimension space (trajectories)

PhD Thesis (1/2)

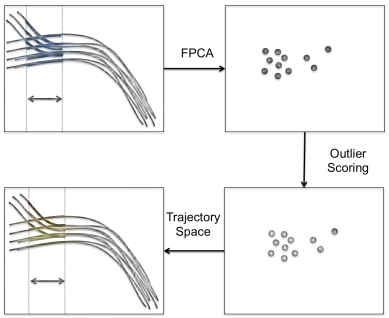
- **Optimization of the structure and activation functions of deep neural networks with application to the prediction and minimization of congestion in passenger flows in airports.** NTU-ENAC-KAUST (Alexis Brun)
- **Collective perception, optimization of the V2X channel with IA** IMT-ENAC-NXP (Dinh Thinh Hoang)
- **Large Scale Trajectory Planing** NTU-ENAC (Paveen Juntama)
- **Optimization strategies for reducing radar interference** ENAC-IMT-NXP (Sylvain Roudière)
- **Optimal Emergency Trajectory design for Airliners** ENAC-KAUST (Andreas Guitart).
- **Dynamic optimization of multimodal passenger mobility** ENAC-TuDelft-SOPRA (Jean-Claude Lebegue)
- **Large Scale Strategic planning of UAV trajectories in cities** ENAC-ONERA (Zhengyi WANG).
- **Detection and Mitigation of Hot Spots in Airspace by Artificial Intelligence** ROWAN-ENAC-FAA (Loïc SHI-GARRIER)
- **Analysis and detection of atypical aircraft approach trajectories using functional data analysis and machine learning** ENAC-KAUST-GT (Gabriel Jarry)
- **Passengers : customers, actors and sensors of air transport** (Philippe Monmousseau)
- **Multipath Parameters Estimation in Physically Based Synthetic Environment Using Deep Neural Regression** ENAC Thomas Gonzalez
- **Noise Abatement Minimization for STAR** AIRBUS (Helicopter)-ENAC-MIT (Pierre Dieumegard)
- **AI Algorithms for ATM Feature Estimation and Prediction** ENAC-Technion (Amir Abecassis)

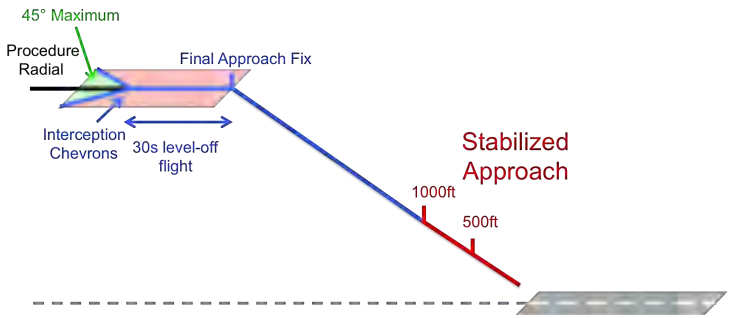
PhD Thesis (2/2)

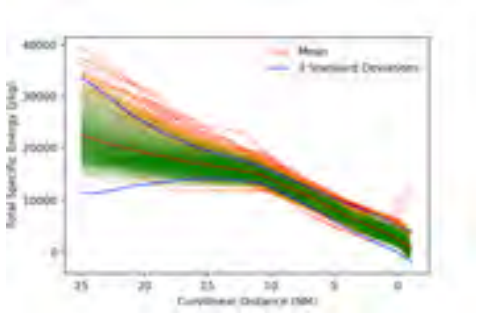
- **Optimization of airport operations during access mode disruptions to improve passengers' experience** (Geoffrey Scozzaro)
- **Optimization for improving the reliability of multimodal door-to-door journeys** (Clara Buire)
- **Optimization of aircraft sequencing in En-Route and terminal areas** (Philippe Notry)
- **AI Diploidic Optimization Applied Air Traffic and Airspace joint Optimization** (Alexis Bregeon)
- **Optimization of airliner trajectories with minimization of climate impact as a new objective** ENAC-AIRBUS-UC3M (Rémi Chevalier)
- **Alternative drone trajectories for the acceptance of urban air mobility** (Antoine Henri)
- **Optimal design of UAV safe emergency trajectories** ENAC-Thales (Maeva Ongale-Obeyi)
- **Optimization of arriving air traffic in the terminal area and extended airspace** (Ying Huo)
- **Applications of machine learning to the resolution of recurring problems in combinatorial optimization** (Luca Mossina)
- **Design of the Optimal Profile of an Aircraft in the Descent and Approach Phases** ENAC-Airbus (Ramon Andreu Altava)
- **Optimization-simulation implementations for the harmonization of operations in large airports** (Paolo Scala)
- **Distances between distributions : Application to Medical Imaging and Aeronautics** ENAC-CERCO (Sana Rebbah)
- **Optimization of air traffic in large airports** ENAC-CAUC (Ma Ji)
- **Correction and Optimization of 4D aircraft trajectories by sharing wind and temperature information** (Karim Legrand)

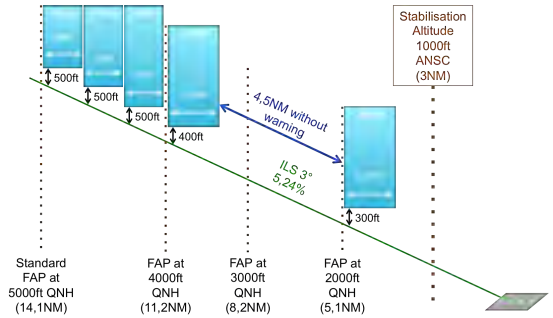
Non Stabilized Approaches Detection

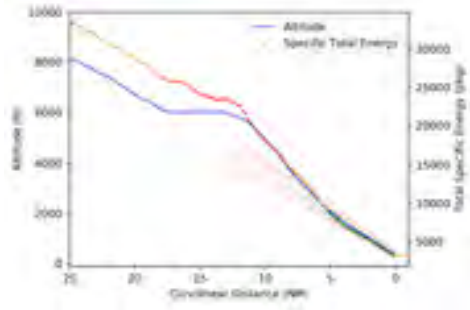
Gabriel Jarry





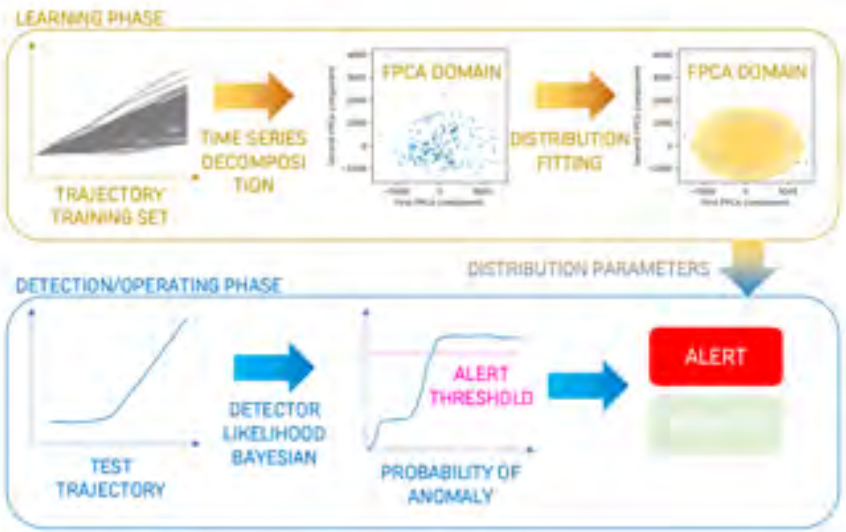


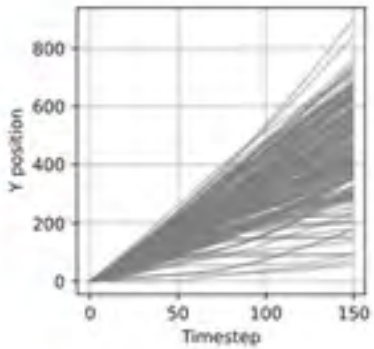




Probabilistic Methods for Real-time Unsupervised Anomalous Trajectory Detection

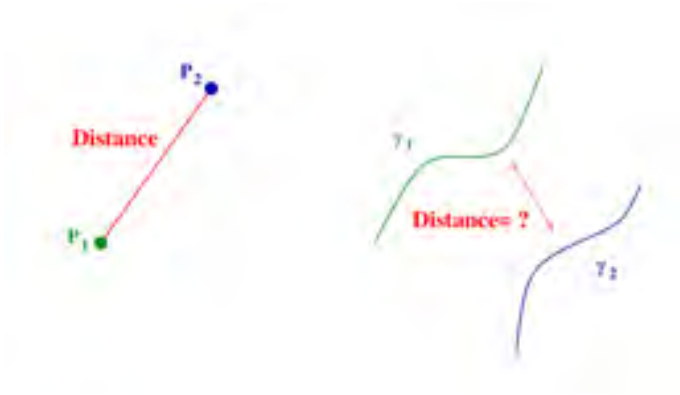
Thinh Hoang-dinh

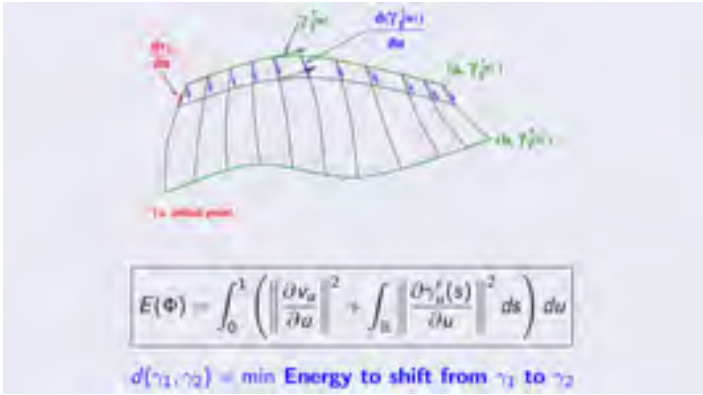


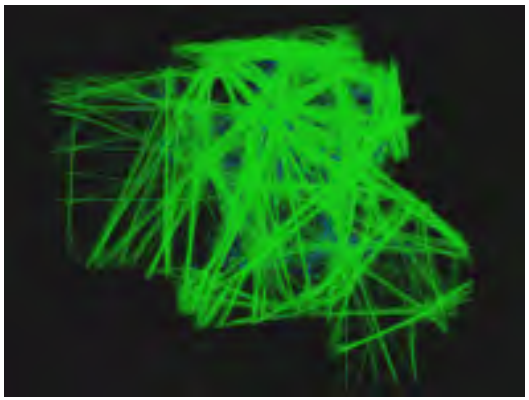


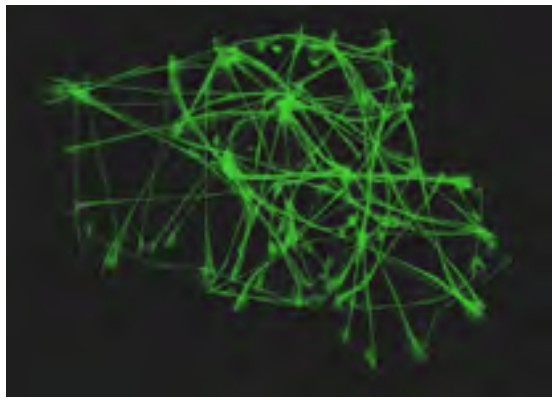
Mathematical Distance Between Aircraft Trajectories

Stéphane Puechmorel



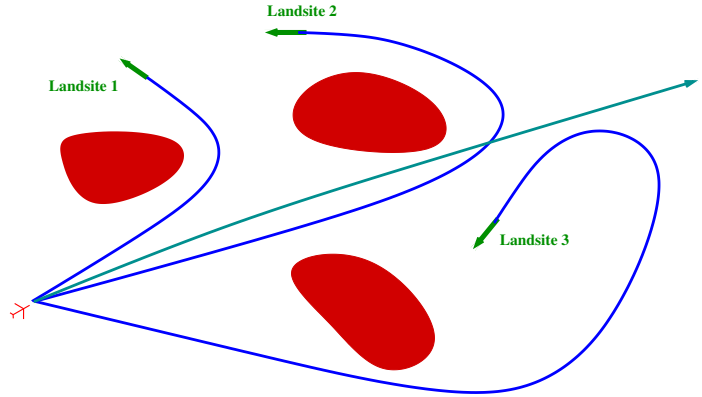






Emergency Trajectory Design

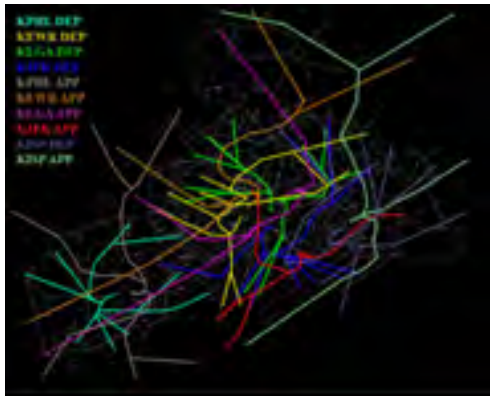
Andreas Guitart

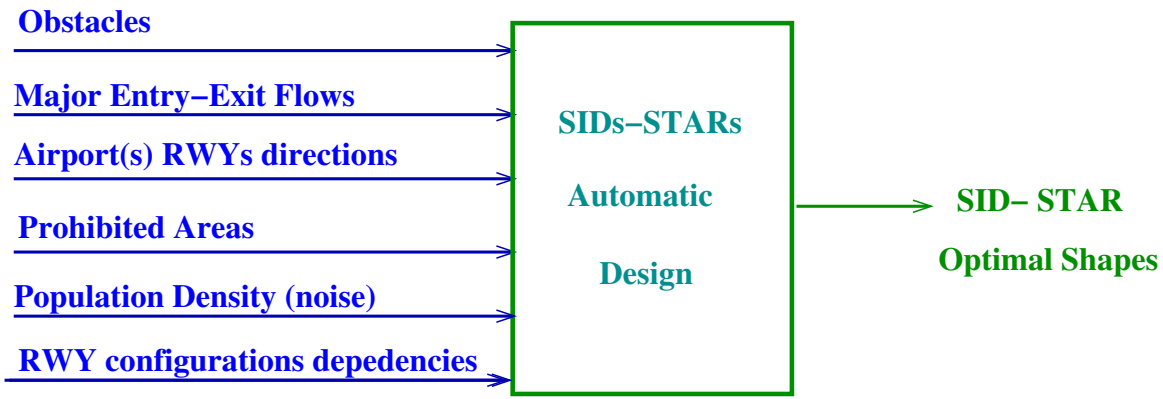


Optimized FMT* algorithm (50 ms for generating one trajectory)

Automatic SID-STAR Design

Andreas Guitart

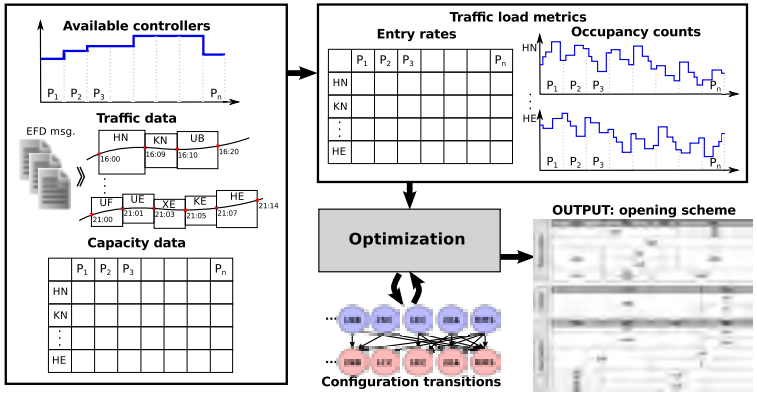


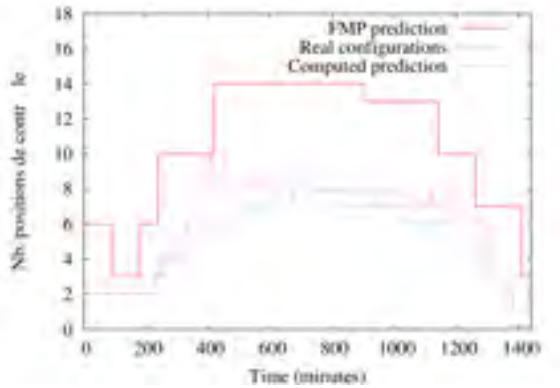


Meta-heuristic+ FMT*

DST for ACC Configuration Optimization

Andrija Vidosavljevic

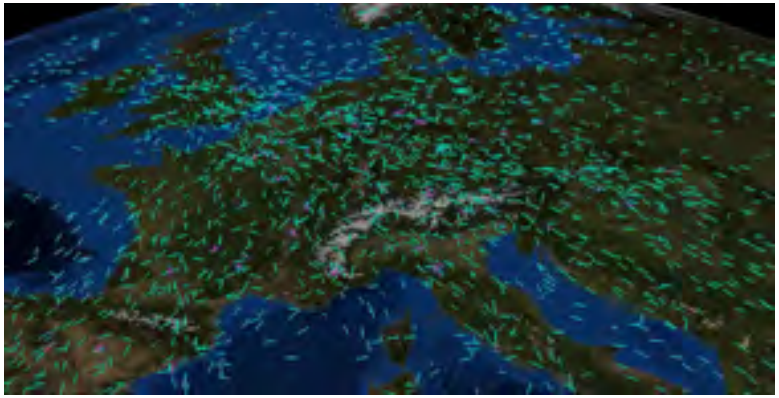


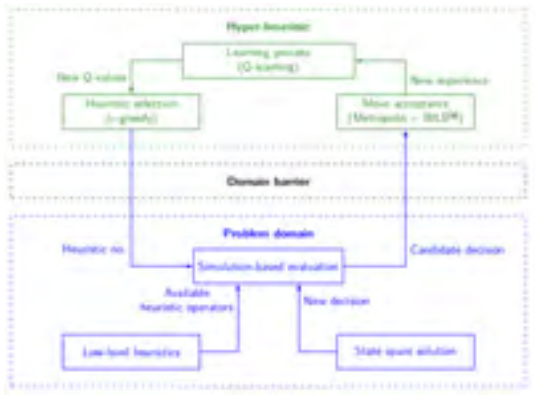


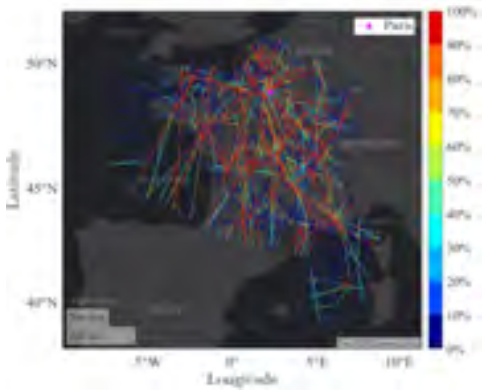
4CAST is now deployed in the five French ACCs
Meta-heuristic+DP+NN

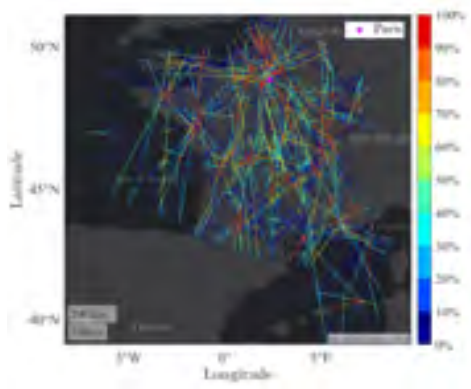
Large-Scale trajectory planning

Paveen Juntama, Julien Lavandier





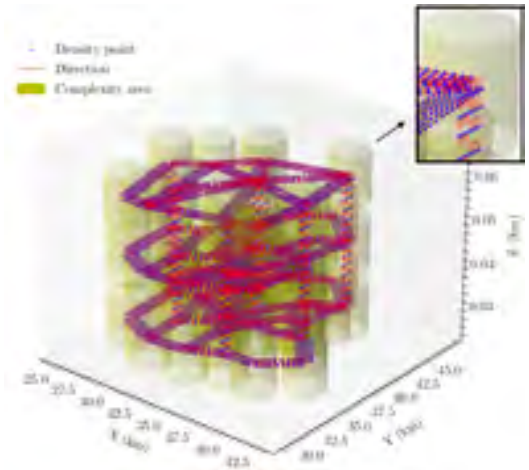


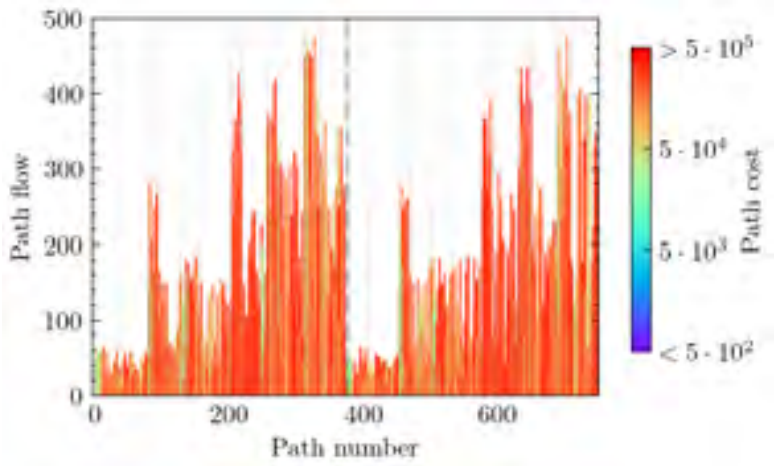


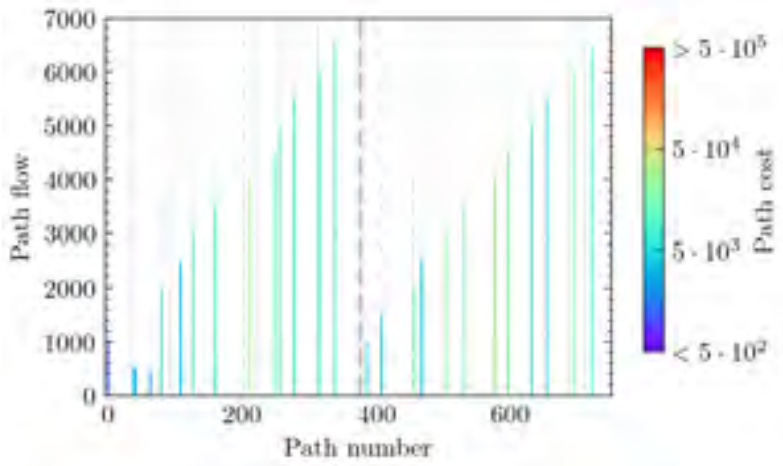
10 minutes computing for 32000 flights (CPU) ; 80% congestion reduction

Large-Scale trajectory planning for UAV (Singapore)

Zhengy Wang



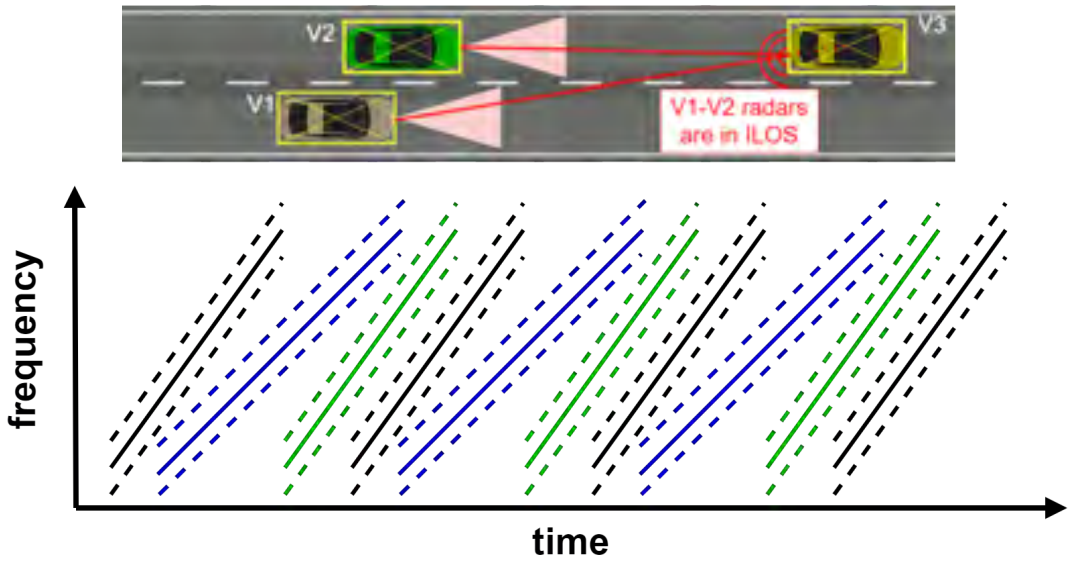


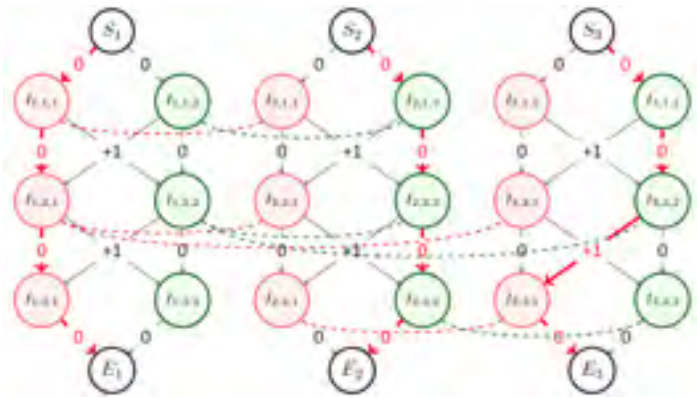


Meta-heuristic+Dafermos

Radar Interference Mitigation With V2X and A.I

Sylvain Roudiere

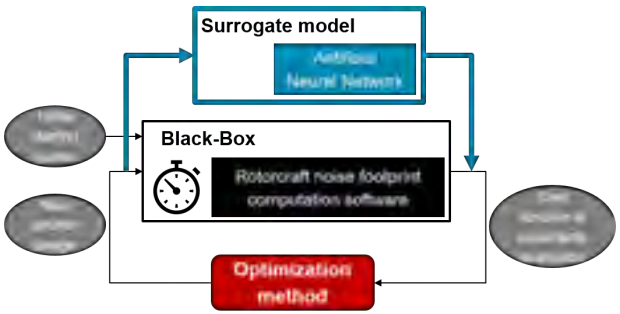


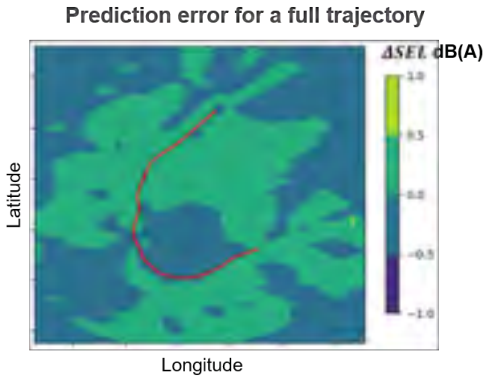


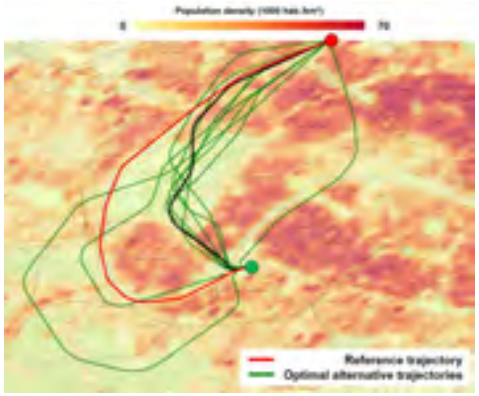
Meta-Heuristic+DP

Design and Optimization of Noise Abatement Procedures for Rotary-wing Aircraft

Pierre Dieumegard

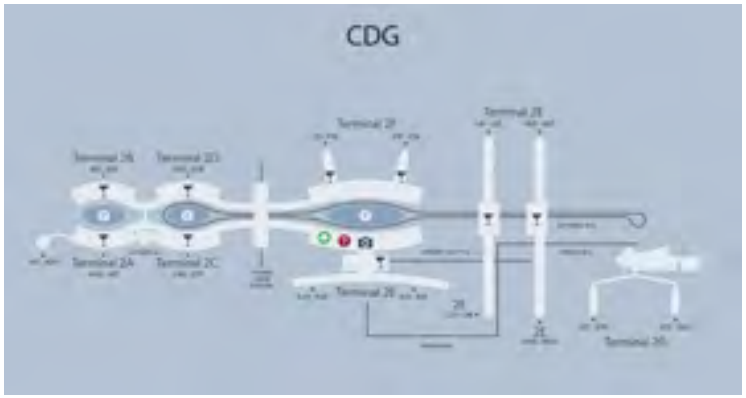


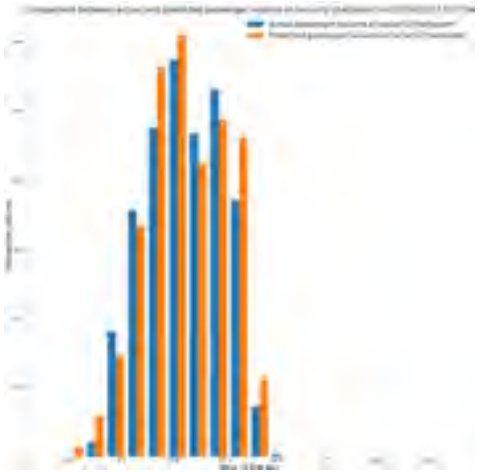


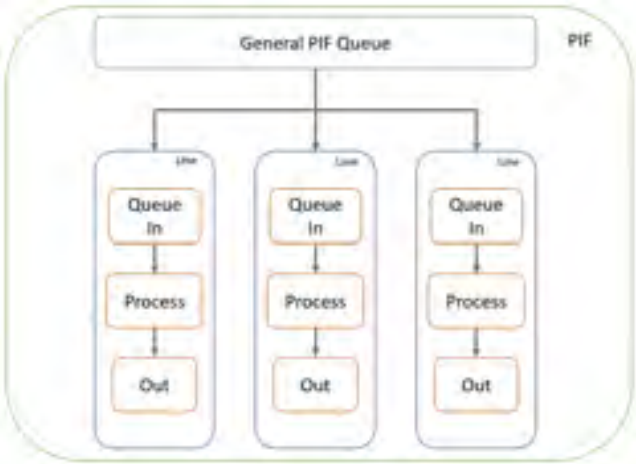


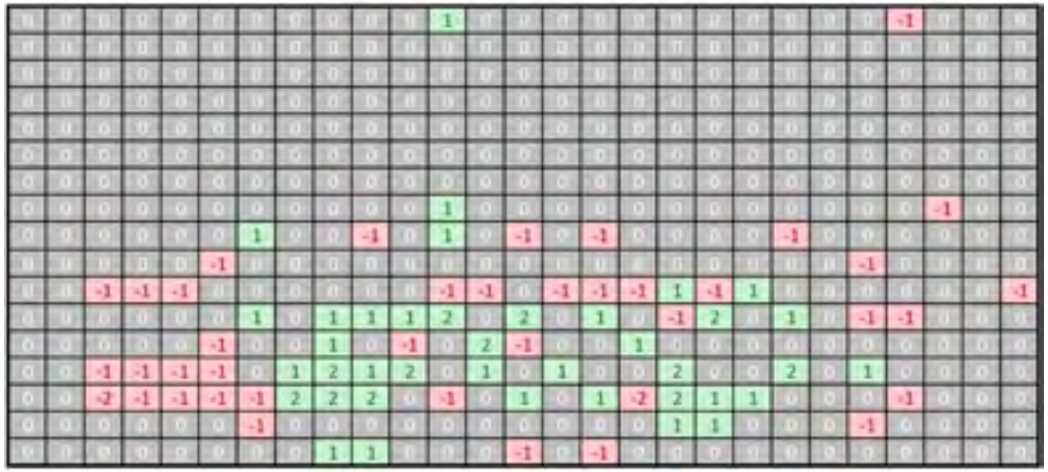
FMT*+DFO (BlackBox

AI for Airport Passengers Flows Optimization



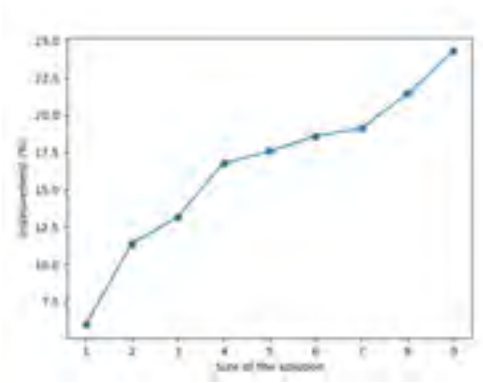


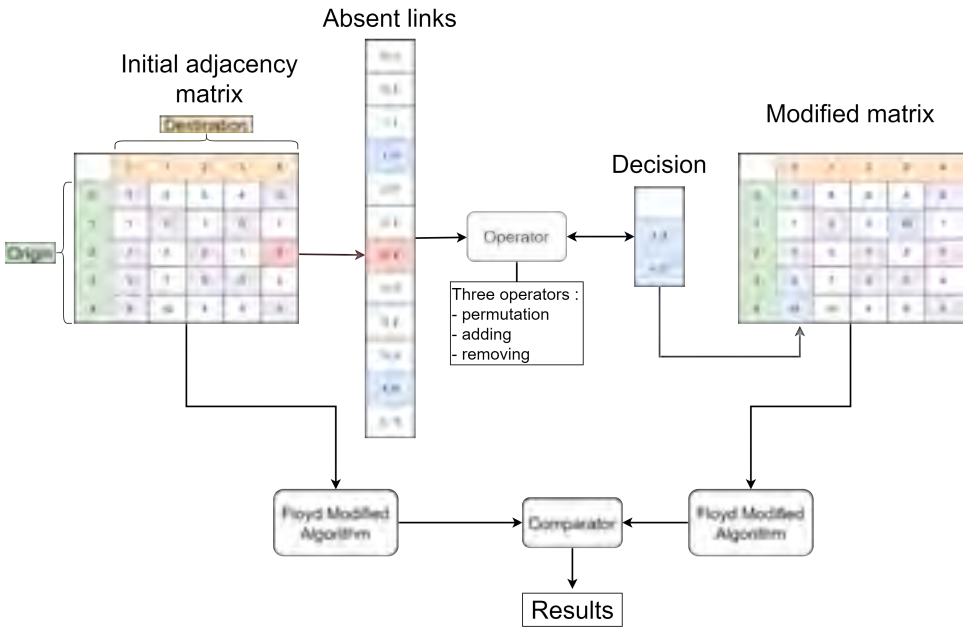




AI for Robust Airline Routing Network

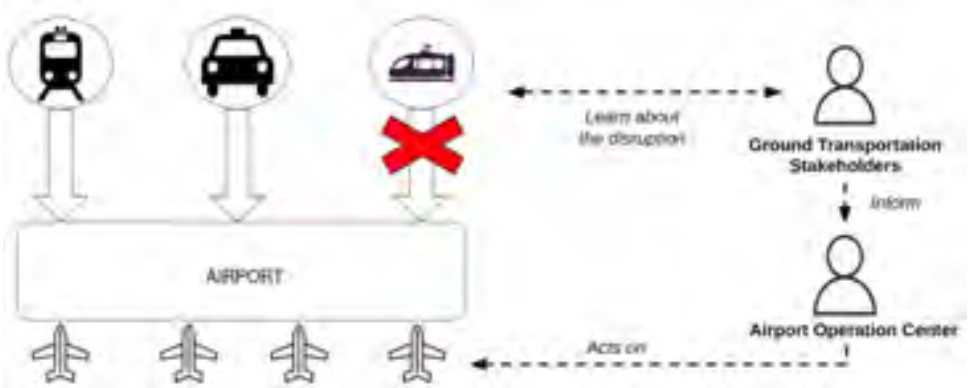
Jean-Claude Lebegue

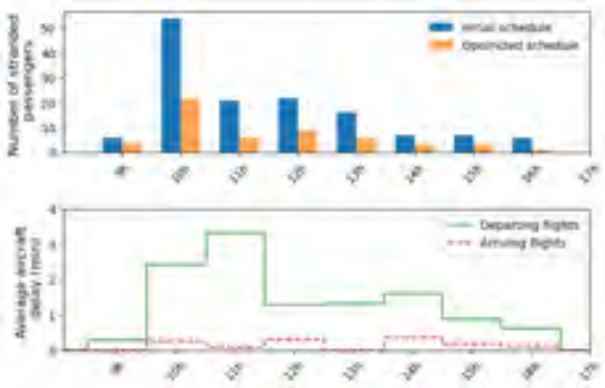




Optimization of airport operations during access mode disruptions to improve passengers' experience

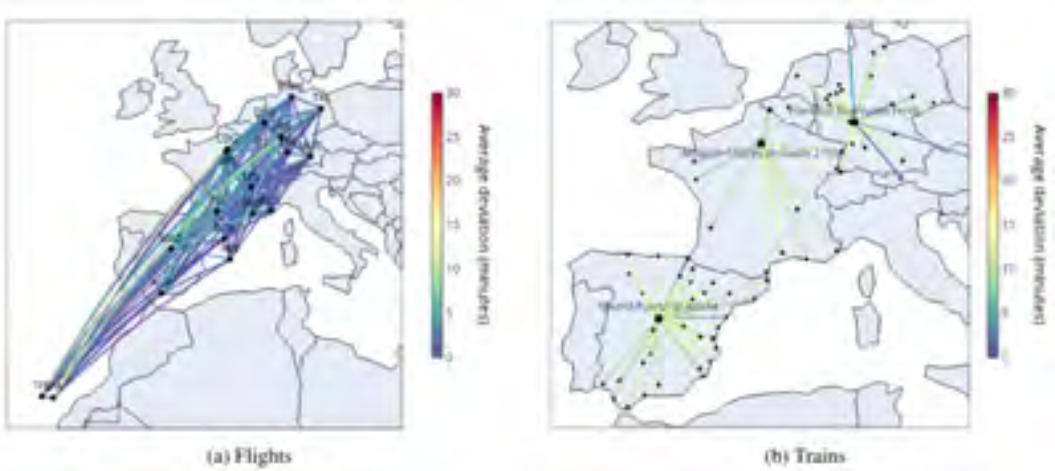
Geoffrey Scozzaro

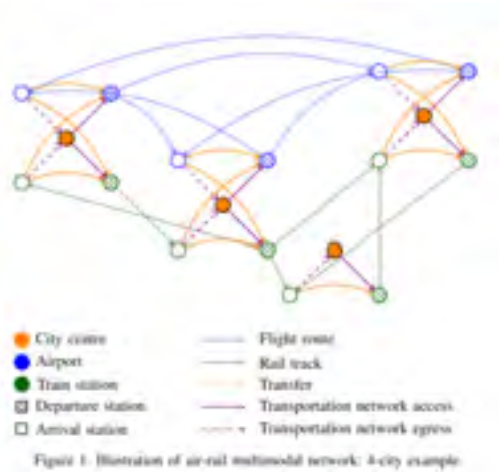


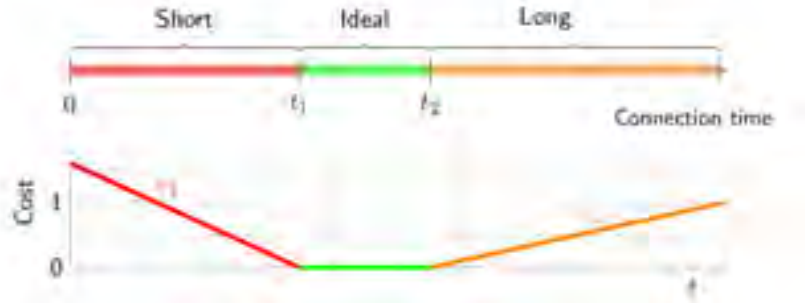


Air Rail Synchronization

Clara Buire







ANITI II

AIRBUS sopra steria THALES

AI for Smart and Sustainable Air Traffic Management and Air Mobility

AI4ATM

Massachusetts Institute of Technology | NANYANG TECHNOLOGICAL UNIVERSITY SINGAPORE | TU Delft | THE GEORGE WASHINGTON UNIVERSITY WASHINGTON, DC





ANITI