

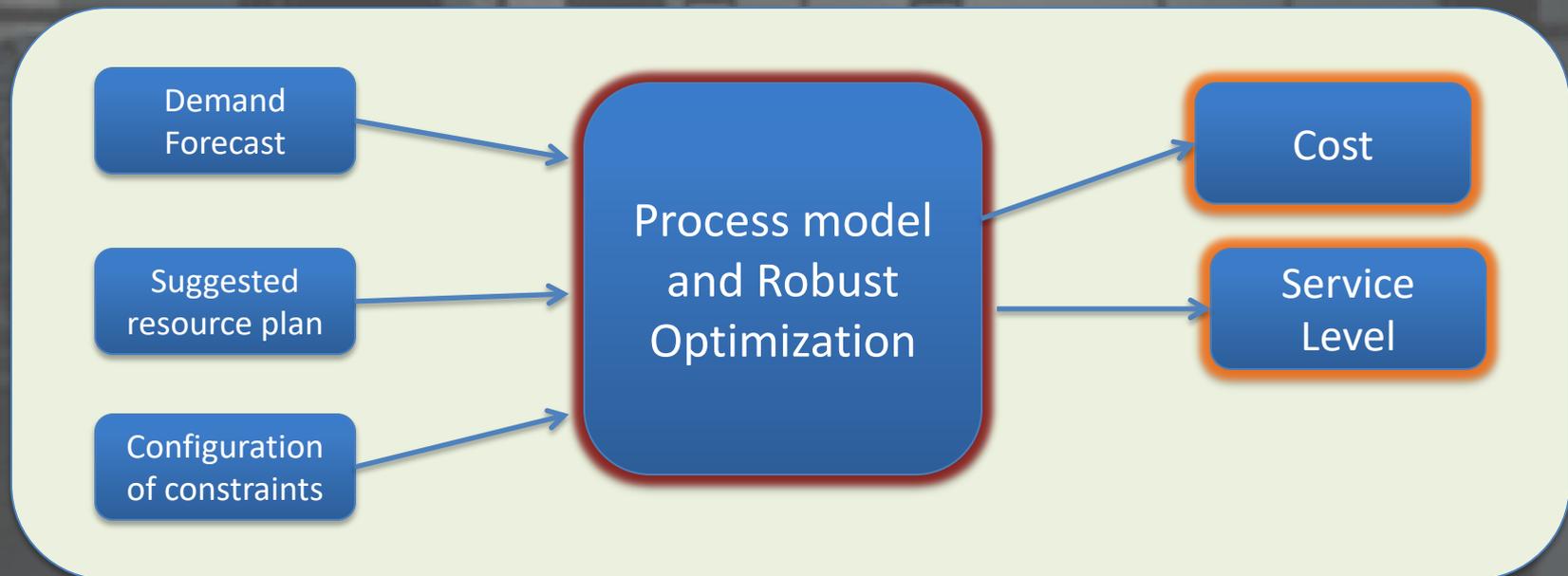
Artificial Intelligence for Data Analysis and Process Optimisation

Dr. Mario Gongora

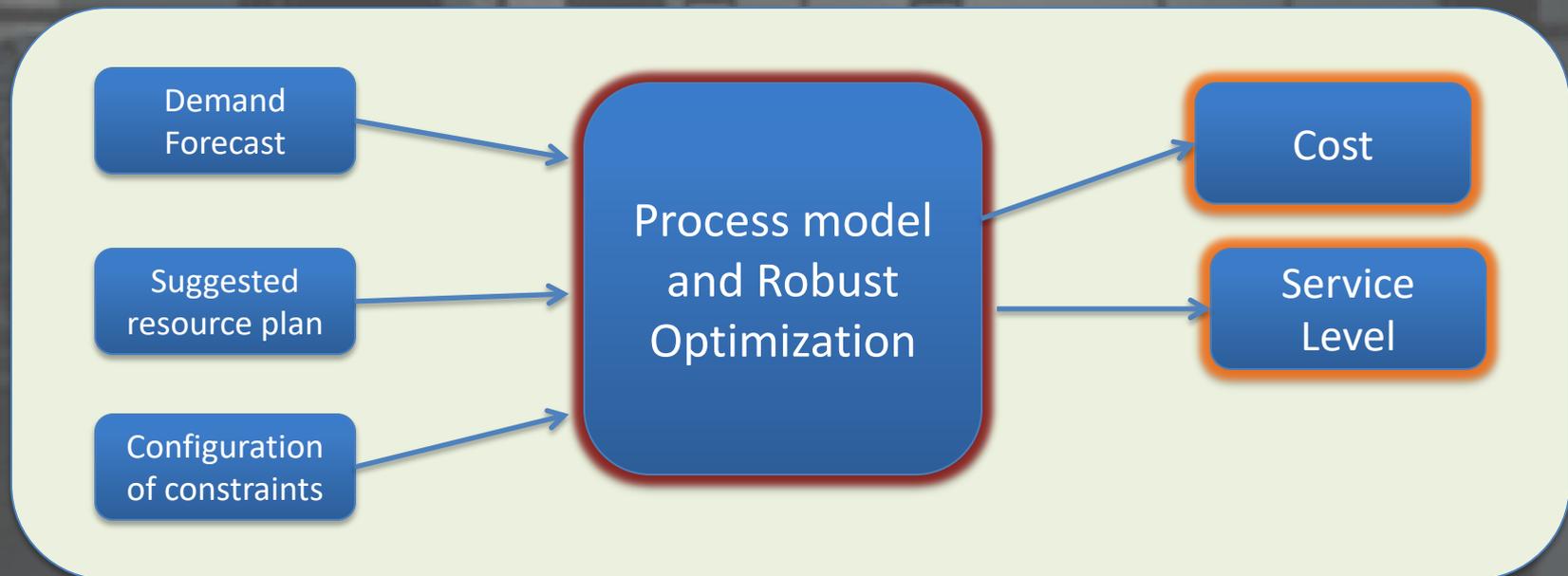
Dr. Fabio Caraffini

Institute of Artificial Intelligence

- Resource plans optimization is the main benefit when having a good forecasting model but optimization is only as good as the accuracy of the forecast...



- Unless we consider uncertainty: we can forecast and model uncertainty to Optimise not only to a plan, but to a range of possibilities present in real life.



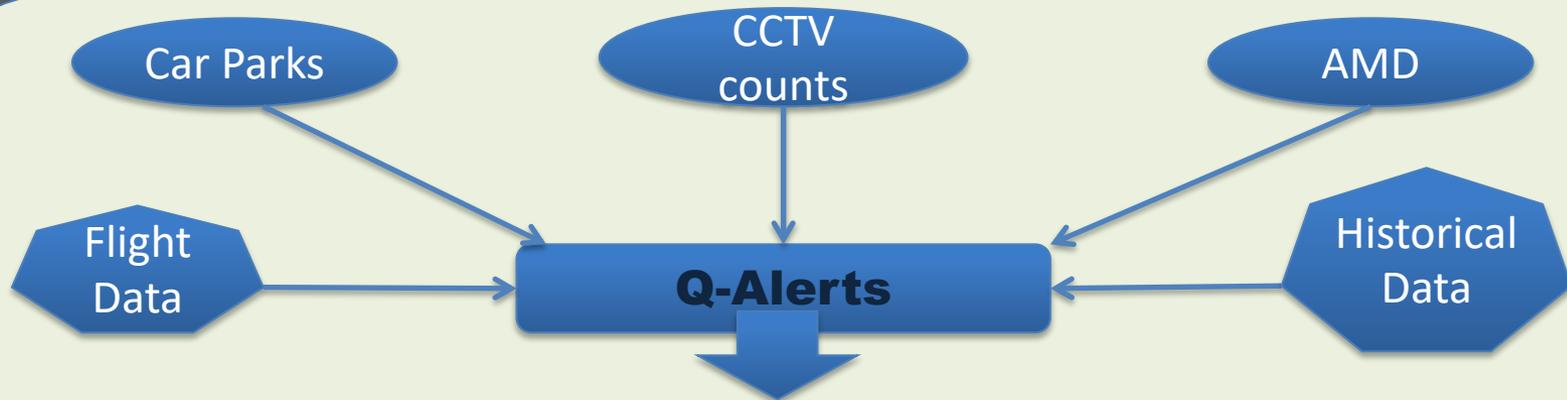
Targeted applications

Customised information provided to:

- IT and data analysis
 - Easier and better analysis of more data
 - Monitoring and reporting to management
- Management
 - Understanding the process better
 - Informed decision making
- Operational supervisors
 - Optimal use of resources with lower costs
- Retail
 - Better service to increase sales
- Contractors
 - Planning without disrupting the process

Targeted applications

Research, contract research,
consulting, commercial



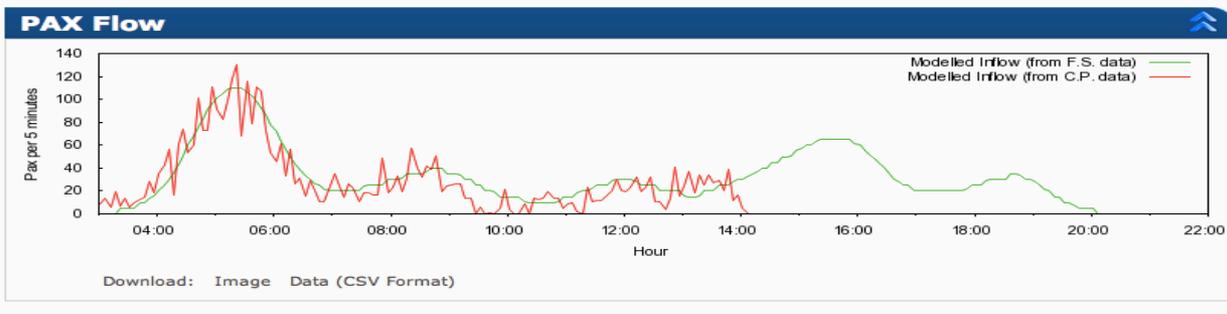
Dates Available:
2010-11-14 to 2010-11-14

Forecast Data Analysis

Nov 2010

Mon	Tue	Wed	Thu	Fri	Sat	Sun
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30		

Selected Day
◀ 14th Nov 2010 ▶



Case studies:
Maximising Operational Efficiency
Intelligent Data Mining and Robust Optimization

Intelligent Data mining and Robust Optimization

- Determines how to implement robust machine learning for modelling and forecasting
- Identify the value of each source of data
- Identify the critical Historical, Forecast and real time data and analyses to provide the best information
- Inform any required acquisition of new systems, adoption of new technologies and implementation of new processes
- Informs directly a large variety of stakeholders and players in management and operations
- Identify and implement the best tools to optimize operations

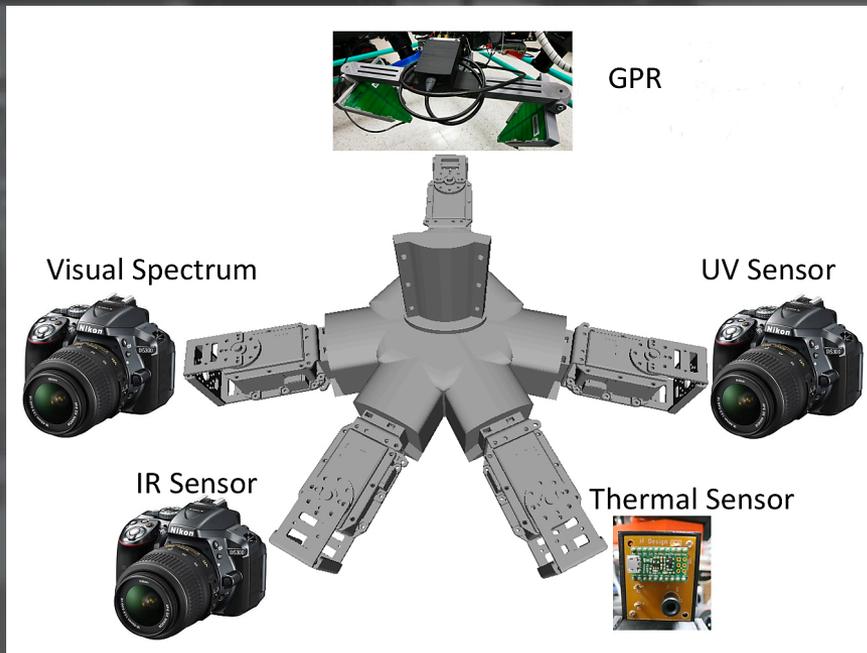
Case studies: *Optimising Use of Land*

Lands that were in no-go zones in ODA countries and are now available for use have many issues from direct effect from war such as land mines, to indirect such as debris, pollution and exhaustion.



Case studies: *Optimising Use of Land*

Sensing land characteristic is very complex and no one sensor or method can achieve this optimally. A multi-agent system and AI based data fusion optimises the performance of various systems.



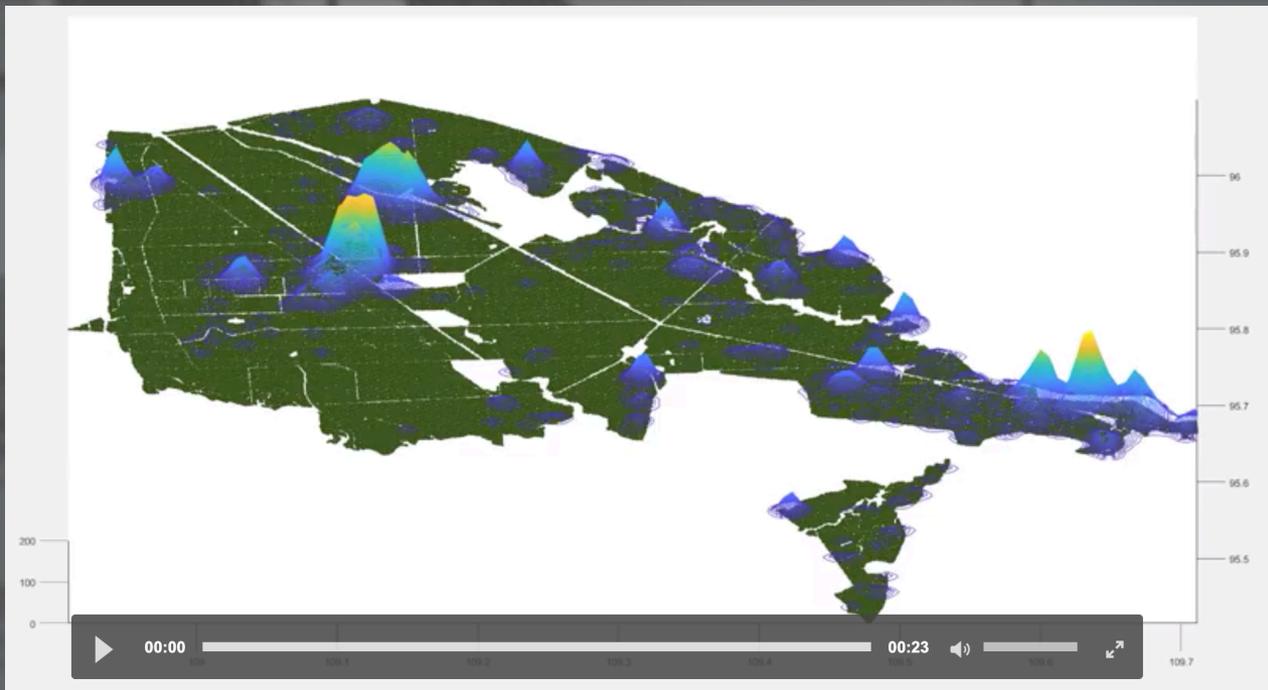
Case studies: *Improving sustainability of oil palm crops*

The Oil Palm is considered by de Colombian Government as a main agricultural products to promote the substitution of illegal crops and for job creation in the countryside for a sustainable peace process.



Case studies: *Improving sustainability of oil palm crops*

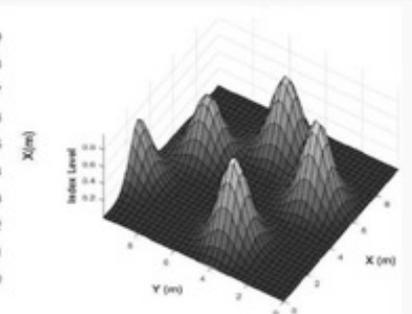
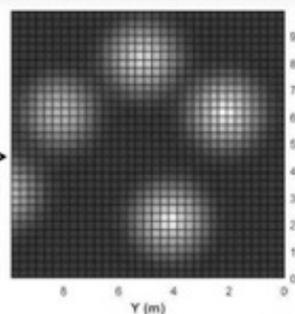
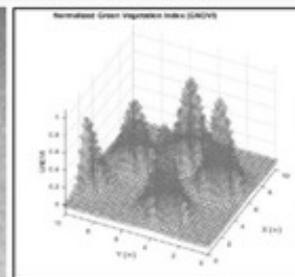
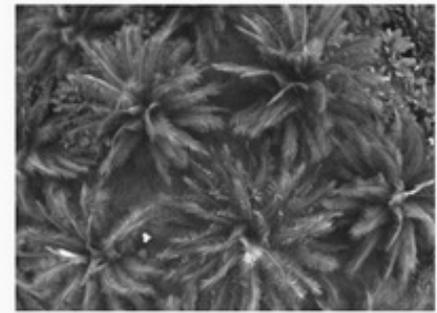
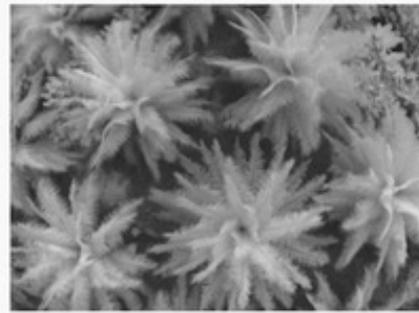
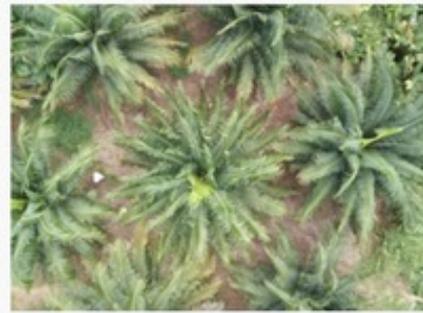
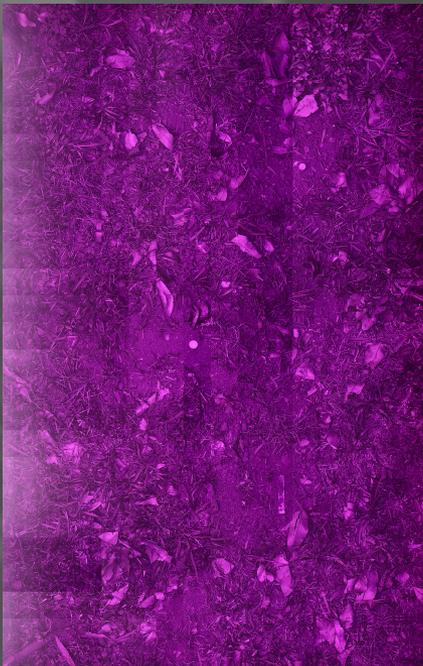
We used an intelligent systems to improve the sustainability of this crop, using novel adaptive vegetation indices obtained from multispectral aerial views and a forecasting model.



Impact:

Technological development roadmaps

We were selected by **Figshare** to participate in a impact case study of successful sharing of research outcomes and data from our GCRF projects, and real world applications.



Impact:

Vision for the future of security

We have significantly contributed to the development of Security Guidelines and their vision for the future of aviation.
Smart Security & NEXTT: Air Transport Security, 2040 and beyond



Smart Security, a joint initiative of the International Air Transport Association (IATA) and Airports Council International (ACI), envisions a future where passengers proceed through security checkpoints with minimal inconvenience, where security resources are allocated based on risk, and where airport facilities are optimized, thus contributing toward an improved journey from curb to airside.



Questions?

Artificial Intelligence for Data Analysis and Process Optimisation

Dr. Mario Gongora

mgongora@dmu.ac.uk

Dr. Fabio Caraffini

Fabio.caraffini@dmu.ac.yk