Burak Suslu

194a Coates Way, Watford / WD25 9PE

Mobile: 07747339661 - Email: burak.suslu@cranfield.ac.uk

Summary

A commercially experienced Research Engineer with a PhD in Transport Systems (Defended Nov 2025) and an MSc in Advanced Electronics. Specializes in bridging the gap between theoretical algorithm design and physical system deployment. Proven track record of developing novel optimization frameworks (MOSOF, NDCI) for complex system diagnostics, backed by 5 years of commercial experience as an Engineering Lead in industrial automation. Expert in translating complex mathematical models (Machine Learning, Fuzzy Logic) into robust, simulation-tested (MATLAB/Simulink) and hardware-validated (C++, Python) prototypes.

CORE COMPETENCIES

- **R&D & Algorithm Design:** Multi-Objective Optimization, Pareto Front Analysis, Sensor Fusion, Prognostics and Health Management (PHM), Signal Processing.
- **Modelling & Simulation:** MATLAB/Simulink (Model-Based Design), System Modelling, Hardware-in-the-Loop (HIL) validation.
- **Prototyping & Software:** Python, C++, Artificial Neural Networks (ANN), VHDL, Git.
- **System Validation:** V-Model verification, statistical process control, handling noisy/high-dimensional datasets.

PROFESSIONAL EXPERIENCE

PhD Researcher - R&D and Algorithm Design | *Cranfield University, UK* | *April 2022 - November 2025*

- **Algorithmic Innovation:** Developed a proprietary Multi-Objective Sensor Optimization Framework (MOSOF) to maximize fault detection probability while minimizing system cost and weight for aerospace diagnostics.
- **Predictive Modeling:** Engineered the "Normalised Diagnostic Contribution Index (NDCI)" to statistically quantify sensor value within complex networks, enhancing predictive maintenance.
- **Simulation & Validation:** Created high-fidelity system models in Python and C++ to simulate fault conditions, rigorously validating algorithm performance against noisy, real-world datasets.
- **Academic Output:** Published three first-author, peer-reviewed papers in *Sensors*, demonstrating the ability to communicate complex mathematical concepts to global technical audiences.

Founder & Lead Research Engineer | *SSL Elektrik-Elektronik, Turkey* | *July 2017 - April 2022*

- **Applied R&D:** Directed the logic design and algorithmic rule sets for industrial control systems, automating decision-making in hazardous Oil & Gas environments.
- **System Optimization:** Spearheaded the integration of IoT sensors and AI-driven algorithms into legacy machinery, modernizing operations and improving energy efficiency by over 20%.
- **Prototype to Production:** Managed the full R&D lifecycle, successfully transitioning conceptual functional specifications into fully commissioned, on-site hardware solutions.

EDUCATION

PhD in Transport Systems (Sensor Optimization) | *Cranfield University, UK* | *Defended Nov 2025*
- Thesis Focus: Multi-objective sensor optimization for aircraft health management systems.

MSc Advanced Electrical and Electronic Engineering (Merit) | *Brunel University London, UK* | *2019*
- Final Project: Designed a high-efficiency preamplifier for radiation sensors in high-temperature well-logging applications.

BEng Electrical & Electronics Engineering (2:1) | *Erciyes University, Turkey* | *2017*
- Final Project: Designed and implemented a compact radar prototype with a 2D object tracking system.

KEY PROJECTS

Industrial Automation Upgrade (Oil & Gas)
- **Client Challenge:** A state-run petroleum facility needed to modernize its cracking tower control systems without extended downtime.
- **My Solution:** Designed a phased retrofit strategy using modern PLCs and safety interlocks.
- **Outcome:** Delivered the project on time and under budget, conducted operator training sessions, and secured a follow-on maintenance contract.

Smart Heating Control System
- **Technical Scope:** Developed an AI-driven temperature control system using Neural Networks.
- **Commercial Value:** Demonstrated significant energy cost savings compared to traditional market solutions, validating the business case for smart control adoption.

Real-Time Wireless Game Interface
- **Technical Scope:** Created a custom FPGA-to-Microcontroller interface for remote interaction.
- **Application:** Showcased the ability to integrate disparate hardware protocols (UART/SPI/ZigBee) into a seamless user experience

Radar Object Tracking & Signal Processing

- **Tech Stack:** Signal Processing, Kalman Filtering (Concept), RF Analytics.
- **Action:** Designed the signal processing pipeline for a 2D radar prototype.
- **Result:** Implemented algorithms for object detection and tracking, converting raw RF signals into structured spatial data for real-time visualization.

Publications

- Burak Suslu; Fakhre Ali; Ian K. Jennions. Understanding the Role of Sensor Optimisation in Complex Systems. *Sensors* **2023**, *23*, 7819. https://doi.org/10.3390/s23187819
- Burak Suslu; Fakhre Ali; Ian K. Jennions. Normalised Diagnostic Contribution Index (NDCI) Integration to Multi Objective Sensor Optimisation Framework (MOSOF) —An Environmental Control System Case. *Sensors* **2025**, *25*, 2661. https://doi.org/10.3390/s25092661
- Burak Suslu; Fakhre Ali; Ian K. Jennions. MOSOF with NDCI: A Cross-Subsystem Evaluation of an Aircraft for an Airline Case Scenario, *Sensors* **2026**, *26(1)*, 160. https://doi.org/10.3390/s26010160