Benaissa Dekhici

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▬▬▬ Personal Statement

Experienced researcher specializing in bioenergy and data-driven innovations, focusing on the intersection of engineering, data science, and sustainable energy systems. Passionate about leveraging advanced modeling, control, and data analytics to solve real-world challenges in bioenergy and environmental engineering.

▬▬▬ Work Experience

Feb 2024–Present **PDRA in Bioenergy Process Optimisation and Control**, *University of Surrey*, England, UK
- Focusing on advanced optimisation under uncertainty for bioenergy industry digitalization
- Linked to UKRI Supergen Bioenergy Impact Hub
- Developing cutting-edge control strategies for sustainable energy systems

Sept 2020–Jun 2021 **Teaching Assistant**, *University of Tlemcen*, Tlemcen, Algeria
- Courses: Linear Multivariable Systems, Nonlinear Systems, Optimal Control
- Supervised undergraduate and graduate students in advanced control theory

Sept 2019–Jun 2020 **Teaching Assistant**, *University of Tlemcen*, Tlemcen, Algeria
- Courses: Multivariable Systems, Nonlinear Systems
- Developed practical laboratory exercises and assessment materials

Jun 2019–Sept 2019 **Trainer/Teacher**, *FROMAC Academy*, Tlemcen, Algeria
- Subject: Automatics and Industrial Data Processing
- Delivered professional training programs to industry professionals

May 2017–Jun 2019 **Research Support State Engineer**, *Research Center in Industrial Technologies, CRTI*, Algiers, Algeria
- Responsible for drone systems development (hardware and software)
- Led interdisciplinary teams in UAV technology advancement
- Contributed to multiple research publications and technical reports

Sept 2016–Oct 2016 **Trainee as Automation Engineer**, *LATAFNA Mill*, Tlemcen, Algeria
- Gained hands-on experience in industrial automation systems
- Worked on process control and optimization projects

Since 2018 **Researcher**, *Tlemcen Automatics Laboratory LAT*, Tlemcen, Algeria
- Active member contributing to laboratory research initiatives
- Collaborating on national and international research projects

▬▬▬ Research Projects

Feb 2024–Present **Rapid Digitalisation of Bioenergy for Higher Efficiency and Profit**, *UKRI Supergen Bioenergy Impact Hub*

Developing advanced optimization frameworks to transform the bioenergy industry into a data-driven, digitalized Industry 4.0 sector. Focus on creating digital decision-making tools for rapid impact in design of experiments, real-time control, and model-based process optimization.

Jan 2025–Aug 2025 **Biomethane Islands – Feasibility Study**, *Future Energy Networks: Network Innovation Allowance*

Developed an optimisation-based model for the design of anaerobic digestion sites servicing Biomethane Islands. Included product demands, feedstock availability, environmental conditions, sizing and capital costing of storage, digesters, gas cleaning, CHP, and carbon capture systems.

Nov 2024–Feb 2025	**D-Xpert: AI-Based Recommender System for Smart Energy Saving**, *Innovate UK Project* ○ Dynamic Heat Flow Model Development and Validation ○ HVAC Operational Profiling & AI Occupancy Model with Lidar input ○ Model Predictive Control Algorithm development ○ Integration with D-XPERT's Mainframe
Jul 2024–Dec 2024	**Integrating CFD Modeling and Kinetics for Enhanced Anaerobic Digestion**, *The Carbon Recycling Network Business Interaction Voucher* Developed automated methodology integrating CFD simulations with kinetic models and advanced Bayesian Optimisation approaches for optimizing anaerobic digester mixing systems to minimize energy usage while maximizing gas yields.
Oct 2024	**Techno-economic Analysis of Novel Water Treatment System**, *Consultancy work with Intelligent Tomorrow Ltd* Developed base simulation for mass and energy balance, cost estimation for capital and operating costs, designed small-scale pilot system, and delivered comprehensive profitability assessment report.

Education

2018–2024	**Ph.D. in Automatics**, *University of Tlemcen*, Tlemcen, Algeria **Thesis:** "Data-Driven Modeling, Order Reduction and Control of Anaerobic Digestion Processes" **Supervisors:** Prof. Boumediene Benyahia & Prof. Brahim Cherki **Co-direction:** LBE-INRAE Narbonne, France **International Mobility:** ○ Bilateral Student at University of Trento (Aug 2022–Jul 2023) ○ International Credit Mobility Student at University of Trento (Aug 2021–Jul 2022)
2013–2015	**M.Sc. in Automatics and Industrial Data Processing**, *University of Tlemcen*, Tlemcen, Algeria **Thesis:** "Commande d'un Quadrirotor Parrot Bebop Drone" **Supervisors:** Prof. Brahim Cherki & Dr. Mokhtari Mohammed Rida.
, 2009–2013	**B.Sc. in Automatics**, *University of Tlemcen*, Tlemcen, Algeria

Key Skills

○ Bioenergy Systems
○ Process Systems Engineering
○ Machine Learning
○ Dynamic System Identification

○ Data-Driven Approaches
○ Model Order Reduction
○ Anaerobic Digestion Processes
○ Control Systems

○ Industrial Informatics
○ Electrical Machines
○ Artificial Intelligence
○ AD and Biogas Expert

Programming:	Python (Advanced), MATLAB/Simulink (Advanced), C++ (Intermediate)
Languages:	Arabic (Native), English (Fluent), French (Fluent)

Hobbies & Interests

Research:	Reading research articles, ML tools exploration, science books, chess
Gaming:	Playing and watching football, video games across all consoles, triple-A games, Nintendo Switch gaming
Technology:	Tech enthusiast (IT, electronics), DIY projects and electronics, 3D printing, Electronic chips and boards, Operating systems exploration
Travel:	Extensive travel experience having lived in Algeria, Italy, Turkey, and the UK, providing multicultural perspective and adaptability