Benaissa Dekhici

Researcher in Bioenergy & Data-Driven Innovations

b.dekhici@surrey.ac.uk *+44 7414 294968* *Webpage*
Google Scholar *ResearchGate* *LinkedIn* *GitHub*

About Me

I am a researcher in Bioenergy and Data-Driven Innovations, with a focus on the intersection of engineering, data science, and sustainable energy systems. My work involves developing advanced modeling, control, and data analytics solutions to address real-world challenges in bioenergy and environmental engineering. I am passionate about leveraging technology to drive progress in sustainability and create a positive impact on a global scale. Extensive travel experience having lived in Algeria, Italy, Turkey, and the UK, providing multicultural perspective and adaptability.

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.

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.

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

2009–2013 **B.Sc. in Automatics**, *University of Tlemcen*, Tlemcen, Algeria

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.

Jan 2025–Aug 2025 **Biomethane Islands – Feasibility Study**, *Future Energy Networks: Network Innovation Allowance*
Developed an optimisation model for designing anaerobic digestion sites for Biomethane Islands, incorporating product demands, feedstock supply, environmental factors, and sizing/costing.

Nov 2024–Feb 2025 **D-Xpert: AI-Based Recommender System for Smart Energy Saving**, *Innovate UK Project*
Dynamic Heat Flow Model Development, HVAC Profiling, AI Occupancy Model, and Model Predictive Control Algorithm development.

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 with kinetic models and Bayesian Optimisation for optimizing anaerobic digester mixing systems.

Oct 2024 **Techno-economic Analysis of Novel Water Treatment System**, *Consultancy with Intelligent Tomorrow Ltd*
Developed base simulation for mass and energy balance, cost estimation, designed pilot system, and delivered profitability assessment.

Technical Skills

Process Engineering: Bioenergy Systems, Process Systems Engineering, Anaerobic Digestion Processes, AD and Biogas Expert

Data Science: Machine Learning, Dynamic System Identification, Data-Driven Approaches, Model Order Reduction, Control Systems, Industrial Informatics, Artificial Intelligence

Programming: Python (Advanced), MATLAB/Simulink (Advanced), C++ (Intermediate)

Languages: English (Fluent), French (Fluent), Arabic (Native)

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