Benaissa Dekhici

Researcher in Bioenergy & Data-Driven Innovations

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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
- 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

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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

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.

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

Developed base simulation for mass and energy balance, cost estimation, designed small-scale pilot system, and delivered profitability assessment.

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	Reading research articles, exploring new ML tools, playing and watching football, traveling, and engaging with new technologies.