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Benaissa Dekhici

Curriculum Vitae

Work Experiences

Feb 2024– Present

PDRA in Bioenergy Process Optimisation and Control, University of Surrey, England, UK

- **Job description:** I form part of a large multi-disciplinary team developing advanced optimisation under uncertainty to rapidly transform the bioenergy industry into a data-driven, digitalized Industry 4.0 sector, to accelerate and enhance its contributions to a Net-Zero UK. The role is linked to the UKRI Supergen Bioenergy Impact Hub. In particular, this role will focus on developing a framework and digitalization roadmap to help companies embrace digital decision-making tools for rapid impact in the design of experiments, real-time control, and model-based process optimization.

May 2017– Jun 2019

Research Support State Engineer, Research Center in Industrial Technologies, CRTI, Algiers, Algeria.

- **Job description:** Responsible for conceptualizing and realizing drone systems, both hardware and software. Key responsibilities included:
  - *Drone Development:** Led the creation and optimization of VTOL drones.
  - *Hardware Integration:** Designed and integrated drone hardware using Arduino and Pixhawk.
  - *Software Engineering:** Developed navigation and control software with Ardupilot.
  - *Coding:** Enhanced drone functionalities through complex coding tasks using C language and Python.
  - *Supervision:** Guided and mentored trainees and Master's students in various engineering fields.

Sept 2016– Oct 2016

Trainee as Automation Engineer , LATAFNA Mill, Tlemcen, Algeria

Education

Oct2018- Jan2024

Ph.D. in Automatics, University of Tlemcen, Tlemcen, Algeria, in co-direction with LBE-INRAE Narbonne, France.

- **Ph.D. Thesis:** "*Data-Driven Modeling, Order Reduction and Control of Anaerobic Digestion Processes*," under supervision of **Prof. Boumediene Benyahia & Prof. Brahim Cherki.**

Sept2013- Jun2015

M.Sc. in Automatics and Industrial Data Processing, University of Tlemcen, Tlemcen, Algeria.

- **M.Sc. Thesis:** "*Commande d'un Quadrirotor Parrot Bebop Drone*," under supervision of **Prof. Brahim Cherki & Dr. Mokhtari Mohammed Rida.**

Sept2009- Jun2013

B.Sc. in Automatics, University of Tlemcen, Tlemcen, Algeria.

Publications

Thesis

○ **Benaissa DEKHICI "Data-Driven Modeling, Order Reduction and Control of Anaerobic Digestion Processes,"**, Jan 2024, `https://doi.org/10.13140/RG.2.2.27352.26883`

Journal Publications

○ **Benaissa DEKHICI**, Boumediene BENYAHIA and Brahim CHERKI. **"DATA-DRIVEN CONTROL OF THE CHEMOSTAT USING THE KOOPMAN OPERATOR THEORY"**, **U.P.B. Sci. Bull., Series C, Vol. 85, Iss. 2** ,pp 137-150, 2023. `https://www.scientificbulletin.upb.ro/rev_docs_arhiva/rezec0_330715.pdf`

○ **Benaissa Dekhici** , Boumediene Benyahia, Brahim Cherki, Luca Fiori, and Gianni Andreottola. 2024. **Modeling of biogas production from hydrothermal carbonization products in a continuous anaerobic digester.** ACM Trans. Model. Comput. Simul. Just Accepted (July 2024). `https://doi.org/10.1145/3680281`

Refereed International Conferences

○ **Benaissa DEKHICI**, Boumediene BENYAHIA and Brahim CHERKI. **"Data-Driven Determination of the Governing Equations of the Continuously Stirred Tank Reactor ."** In the **2023 10th International Conference on Electrical and Electronics Engineering (ICEEE 2023)**, Istanbul, Turkey, May 8-10, 2023. `https://doi.org/10.1109/ICEEE59925.2023.00081`

○ **Benaissa DEKHICI**, Boumediene BENYAHIA and Brahim CHERKI. "Dynamic Mode Decomposition with Control for Data-driven Modeling of Anaerobic Digestion Process." In the **2022 16th African Conference on Research in Computer Science and Applied Mathematics (CARI)**, Tunis, Tunisia, 2022. `https://hal.science/hal-03696038`

○ **Benaissa DEKHICI**, Boumediene BENYAHIA and Brahim CHERKI, "Forecast of chemostat dynamics using data-driven approach," **2021 International Conference on Control, Automation and Diagnosis (ICCAD)**, Grenoble, France, 2021, pp. 1-6, doi: 10.1109/ICCAD52417.2021.9638749. `https://doi.org/10.1109/iccad52417.2021.9638749`

○ **Benaissa DEKHICI**, Boumediene BENYAHIA and Brahim CHERKI. "Model order reduction using Dynamic Mode Decomposition: Application to the Anaerobic Digestion Model N.1 (ADM1)" In the **2020 15th African Conference on Research in Computer Science and Applied Mathematics (CARI)**, Thiès, Senegal, 2020. `https://hal.science/hal-02928872`

▬ Research Experiences

Aug 2022– Jul 2023	**Bilateral student**, Enrolled as Bilateral student within the framework UniTrento Bilateral Agreements between the University of Trento in Italy and The University of Tlemcen Algeria under the supervision of Prof. Luca Fiori & Prof. Gianni Andreottola.
Aug 2021– Jul 2022	**International Credit Mobility student**, Enrolled as an incoming exchange student within the framework of Erasmus+ International Credit Mobility Program at the University of Trento in Italy under the supervision of Prof. Luca Fiori & Prof. Gianni Andreottola.
Since 2018	**Researcher**, Member of the Tlemcen Automatics Laboratory LAT `http://lat.univ-tlemcen.dz/`

▬ Teaching Experiences

Sept 2020- Jun2021	**Teaching Assistant**, Linear Multivariable Systems, Nonlinear Systems, Optimal Control , Department of Engineering, University of Tlemcen, Tlemcen, Algeria
Sept 2019- Jun2020	**Teaching Assistant**, Multivariable Systems, Nonlinear Systems, Department of Engineering, University of Tlemcen, Tlemcen, Algeria

Jun 2019- Sept2019	**Trainer/Teacher**, *Automatics and Industrial Data Processing*, FROMAC Academy, Tlemcen, Algeria

Skills

- **Python**
  Pyomo, Pandas, NumPy, SciPy, MatPlotLib, Keras ...
- **MATLAB**
  Solve engineering problems using different Matlab and Simulink Toolboxes
- **SQL**
  SQL Server, MySQL, PostgreSQL
- **Excel**
  Conditional Formatting, Pivot Tables
- **Industrial Informatics**
  Simatic Step7 Siemens, Allen-Bradley, Schneider.
- **Electrical**
  Electrical Machines and Transformers, Electrical Networks and Variable Speed Drives.
- **Electronic**
  Circuit analysis, Digital and analogue electronics, Measurement techniques.

Activities

- Successfully delivered an oral presentation at the 6th Annual EBNet Early Career Researcher Conference (ECR24) at Newcastle University! 24-26 July 2024, Newcastle.
- Successfully delivered an oral presentation at 2023 10th International Conference on Electrical and Electronics Engineering (ICEEE 2023), held in Istanbul, Turkey during May 8-10, 2023.
- Participation In the 2022 16th African Conference on Research in Computer Science and Applied Mathematics (CARI), Tunis, Tunisia, 2022.
- Took the Online Professional English Network's (OPEN) 2022 English for Science, Technology, Engineering, and Mathematics (STEM) massive open online course (MOOC) developed by the University of Pennsylvania and adapted by FHI 360, Nov 23, 2022.
- Participation in IEEE 2021 International Conference on Control, Automation and Diagnosis (ICCAD), Grenoble, France, 2021.
- Participation in IEEE Authorship and Open Access Symposium on "How to publish Open Access with IEEE to increase the exposure and impact of your research", organized by IEEE Xplore, 29 Sept 2021.
- Present a summary of my research at the University of Trento "Data-driven Modeling, Order Reduction and Control of the Anaerobic Digestion Process", Trento, Italy, 16 Sept 2021.
- Participation in the Spring School on Data-driven Model Learning of Dynamic Systems, organized by the Ecole Central de Lyon -Ecully-France, Virtual Edition, 6-9 Apr 2021.
- Participation in the " Webinaire commun entre le réseau TREASURE et le réseau REUSE d'INRAE" – Reunion TREASURE for treatment and Sustainable Reuse of Effluents in Semiarid Climates, Jan 2021.
- Participation in the 2020 15th African Conference on Research in Computer Science and Applied Mathematics (CARI), Thiès, Senegal, 2020.
- Participation in the Annual PhD seminar, Laboratoire d'Automatique de Tlemcen, Tlemcen, Algeria, Jan 2019.
- Training in Deep Learning jointly organized by the University of Tlemcen and the Rowan University -New Jersey- USA in Tlemcen, 28-29 April 2019.

Languages

- **Language: Arabic** Native
- **Language: English** Fluent
  (Reading:C2, Listening:C2, Speaking:C2, Writing:C1)
- **Language: French** Fluent
  (Reading:C2, Listening:C2, Speaking:C1, Writing:C1)