Curriculum Vitæ

DR. HEBBAL ALI

Data Scientist/ Research Engineer ⋄ Hybrid Intelligence - Capgemini
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EDUCATION

- 10/2017-10/2020 : Ph.D. at ONERA - The French Aerospace Lab and Laboratoire CRIStAL (Université de Lille). Deep Gaussian processes for analysis and optimization of complex systems.
- 09/2016-09/2017 : Master of Research in Computer Science, MODO (Modeling, Optimization, Decision, Organization), Université Paris Dauphine.
- 09/2013-07/2016 : Engineering Curriculum. Industrial engineering with a specialization in supply chain engineering, Ecole Mohammadia d'Ingénieurs (Morocco).

EXPERIENCES

Tessella - Capgemini, Paris (France) 03/2021-
Research Engineer/ Consultant

Bayesian optimization consultant for Merck where the goal is to optimize the processes in bio-reactors. An application was developed and deployed for process optimization.

Operational research consultant on the Airline Sciences project of Airbus where the goal is to develop an Airline digital twin. An exploration tool based on a constraint programming model is developed for layout cabin configuration.

Responsible for the data axis on the project DTXIA for automatic system architecture.

ONERA - The French Aerospace Lab, Paris (France) 10/2017-1/2021
PhD thesis

· Contributions on Bayesian optimization using Deep Gaussian Processes for non-stationary problems, multi-fidelity modeling with varying input space dimensions, and multi-objective Bayesian optimization with correlated objectives.

ONERA - The French Aerospace Lab, Paris (France) 3/2017-9/2017
MRes internship

· Elaboration of methodologies for multi-objective design optimization problems of aerospace vehicles. Application of multi-objective evolutionary algorithms and surrogate based multi-objective approaches.

Compagnie de Transports au Maroc (CTM), Casablanca (Morocco) 2/2016-7/2016
Engineering internship

· Optimization of the allocation of vehicles to journeys, using various operational research approaches. Results: -reduction of the number of vehicles used by 30. -automatic and monthly planning of the assignment.

Office Chérifien des Phosphates (OCP Group), El Jadida (Morocco) 6/2015-8/2015
Application internship

· Improvement of the maintenance management of the logistics park within the OCP Jorf Lasfar industrial complex.

AWARDS AND DISTINCTIONS

2020: Best Ph.D. thesis at ONERA - TIS Department.
Deep Gaussian processes for analysis and optimization of complex systems.
2016: Best final year thesis at Ecole Mohammadia d'Ingénieurs - Supply chain option.
Optimization of the allocation of vehicles to journeys at CTM.

RESEARCH INTERESTS

Bayesian modeling • Bayesian deep learning • Gaussian processes • Bayesian optimization • Evolutionary computation • Operational research.

COMPUTER SKILLS

Programming Languages	Python, LaTeX, R, Comet, Visual Basic .NET
Machine Learning software libraries	TensorFlow, Torch, Keras, Sci-kit learn
OR optimization softwares	Cplex, ORTools, Lingo

TEACHING AND TRAINING ACTIVITIES

- 2019-2021: Teaching assistant and course designer of the course **Machine Learning and Optimization** and lab sessions using *Python* held at Université de Lille for MRes 2 by Prof. Nouredine Melab.
- October 2019: Trainer for the training **Estimation and Optimization of Complex Systems** and lab sessions using *Python* held at EUROSAE Toulouse by Prof. Jérôme Morio.
- 2018-2019: Teaching assistant of the course **Probability and Statistics** held at Université de Versailles Saint-Quentin-en-Yvelines for L2 by Prof. Brigitte Chauvin.

PUBLICATIONS

Journal papers:

- Hebbal, A., Balesdent, M., Brevault, L., Melab, N., Talbi, E. G. (2022). Deep Gaussian process for multi-objective Bayesian optimization. Optimization and Engineering, 1-40.
- Hebbal, A., Brevault, L., Balesdent, M., Talbi, E. G., Melab, N. (2021). Multi-fidelity modeling with different input domain definitions using deep Gaussian processes. Structural and Multidisciplinary Optimization, 63, 2267-2288.
- Hebbal, A., Brevault, L., Balesdent, M., Talbi, E., and Melab, N., Bayesian optimization using deep Gaussian processes with applications to aerospace system design. Optim Eng (2020). https ://doi.org/10.1007/s11081-020-09517-8
- Brevault, L., Balesdent, M., and Hebbal, A. (2020). Multi-objective multidisciplinary design optimization approach for partially reusable launch vehicle design. Journal of Spacecraft and Rockets, 57(2), 373-390.
- Hebbal, A., Brevault, L., Balesdent, M., Talbi, E., and Melab, N., Multi-fidelity modeling with different input domain definitions using Deep Gaussian Processes. *submitted to* Structural and Multidisciplinary Optimization Journal.

Book chapters:

- Brevault, L., Pelamatti, J., Hebbal, A., Balesdent, M., Talbi, E. G., and Melab, N. (2020). MDO Related Issues : Multi-Objective and Mixed Continuous/Discrete Optimization. In Aerospace System Analysis and Optimization in Uncertainty (pp. 321-358). Springer, Cham.

- Brevault, L., Balesdent, M., and Hebbal, A. (2020). Expendable and Reusable Launch Vehicle Design. In Aerospace System Analysis and Optimization in Uncertainty (pp. 421-476). Springer, Cham.

Communications:

- Hebbal, A., Brevault, L., Balesdent, M., Talbi, E., and Melab, N., Multi-fidelity modeling using DGPs : Improvements and a generalization to varying input space dimensions à 4th workshop on Bayesian Deep Learning (NeurIPS 2019), Vancouver, Canada.
- Hebbal, A., Brevault, L., Balesdent, M., Talbi, E., and Melab, N., A Deep Gaussian Process based model for Multi-Objective optimization à The 13th International Conference on Multiple Objective Programming and Goal Programming (MOPGP) 2019.
- Hebbal, A., Brevault, L., Balesdent, M., Talbi, E., and Melab, N., Multi-objective optimization using Deep Gaussian Processes : Application to Aerospace Vehicle Design, AIAA SciTech 2019.
- Brevault, L., Balesdent, M., Hebbal, A., and Patureau De Mirand, A., Surrogate model-based multi-objective MDO approach for partially Reusable Launch Vehicle design, AIAA SciTech 2019.
- Hebbal, A., Brevault, L., Balesdent, M., Talbi, E., and Melab, N., Bayesian Optimization using Deep Gaussian Processes for non-stationary problems, PGMO days 2018.
- Hebbal, A., Brevault, L., Balesdent, M., Talbi, E., and Melab, N., Efficient Global Optimization with Deep Gaussian Processes," Evolutionary Computation (CEC), 2018 IEEE Congress

OTHERS

Languages	english (fluent), french (fluent), arabic (mothertongue).
Sports	football, biking and hiking.
Interest	philosophy, sports, traveling and science reading.