Hamza Cherkaoui

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Interests

Bandits; Bayesian Optimization; Convex Optimization; Deep Learning; Dictionary Learning

Research experience

2022–now
Post doctorate position

Post doctoral position, Huawei Technologies, Paris, France
- *Collaborators*: Dr. Igor Colin and Dr. Merwan Barlier.
- I focus my research on the multi-agents linear bandits problems.
- Fields of interest: *multi-/single agent(s) linear bandits, Bayesian optimization, convex optimization, deep learning.*
- 2 pre-print under review.

2021
Post doctorate position

Post doctoral position, BioMaps research team, CEA-Saclay, Orsay, France
- I continue my research on the estimation of the Haemodynamic Response Function (HRF) from fMRI data in a pharmacological context.
- Published 1 International Conference Proceedings.

2017–2021
PhD program

PhD program, PARIETAL research team, CEA-Saclay / INRIA-Saclay, France
- *Research subject: 'Efficient whole brain estimation of the haemodynamic response function for TV-regularized semi-blind deconvolution of neural activity in fMRI*
- *Supervisors*: Dr. Philippe Ciuciu, Dr. Thomas Moreau and Dr. Claire Leroy
- Published 5 International Conference Proceedings and 1 Journal Articles.

Education

2016–2017
Master program, Ecole Polytechnique, Palaiseau, France
- *Master of Research:* Data Sciences
- Cross disciplinary courses: Machine Learning Theory, Kernel methods, Convex Optimization.

2015–2016
Master program, University Lille 1, Villeneuve d'Ascq, France
- *Master of Research:* Applied mathematics
- Focused on Probability and Statistic.

2012–2016
Ecole Centrale de Lille, Villeneuve d'Ascq, France
- *Master of Engineering:* diplome d'ingénieur de l'Ecole Centrale de Lille.
- Cross disciplinary courses centered around mathematics and computer science.

Other Experiences

2017
April–September

Researcher assistant (internship), PARIETAL research team, Neurospin laboratory CEA-Saclay, France
- I optimized the reconstruction process of MRI images to enhance image quality with Compressed Sensing tools.

2016
June–August

Research engineer (internship), MODAL research team, INRIA Lille, France
- *Software development project:* Development of a new R package providing tools to cluster categorical functions with on an efficient `C++` back-end implementation.

2015
April–July

Software developer (internship), DataRobot, Boston, USA
- *Software development project:* Implementation of the decision tree induction algorithm (from `Scikit-Learn`) used within the start-up to support multi-threading.

2014
May–December

Software developer (internship), Logilab, Paris, France
- *Software development project:* Implementation of a Python library based on `CGAL` library (`Python/C++ binding`) & development of a web-client toolkit to use a computation platform.

Languages & Computer Science skills

- *Languages:* French (mother-tongue)   English (TOEIC 970/990, fluent)
- *Collaborative tools:* `Git`
- *Softwares:* `Python (knownledge in Cython, C, C++)`
- *Libraries:* `Numpy, Pandas, Numba, pyTorch, pyTorch-Geometric, Scipy, Scikit-learn, ...`

Publications

[1] Cherkaoui, H. and Barlier, M. and Colin, I. *Clustered Multi-Agent Linear Bandits*, Pre-print under review, 2023.

[2] Shang, X. and Colin, I. and Cherkaoui, H. and Barlier, M. *Price of Safety in Linear Best Arm Identification*, Pre-print under review, 2023.

[3] Cherkaoui, H. and Moreau, T. and Halimi, A. and Leroy, C. and Ciuciu, P. *Multivariate semi-blind deconvolution of fMRI time series*, NeuroImage, 2021.

[4] Cherkaoui, H. *Efficient whole brain estimation of the haemodynamic response function for TV-regularized semi-blind deconvolution of neural activity in fMRI*, Ph.D. thesis, 2021.

[5] Cherkaoui, H. and Moreau, T. and Ciuciu, P. and Fernandez, B. and Bottlaender, M. and Tournier, N. and Leroy, C. *Characterization of the haemodynamic response function after a buprenorphine challenge study in Human healthy volunteer*, 27th Annual Meeting and Educational Courses of OHBM, 2021.

[6] Cherkaoui, H. and Sulam, J. and Moreau, T. *Learning to solve TV regularised problems with unrolled algorithms*, 34th Conference and Workshop on Neural Information Processing Systems (NeurIPS), 2020.

[7] Cherkaoui, H. and Moreau, T. and Halimi, A. and Ciuciu, P. *Sparsity-based blind deconvolution of neural activation signal in fMRI*, 44th International Conference on Acoustics, Speech and Signal Processing (ICASSP), 2019.

[8] Cherkaoui, H. and Moreau, T. and Halimi, A. and Ciuciu, P. *fMRI BOLD signal decomposition using a multivariate low-rank model*, 27th European Signal Processing Conference (EUSIPCO), 2019.

[9] Cherkaoui, H. and Gueddari, L. and Lazarus, C. and Grigis, A. and Poupon, F. and Vignaud, A. and Farrens, S. and Starck, J.-L.. and Ciuciu, P. *Analysis vs synthesis-based regularization for combined compressed sensing and parallel MRI reconstruction at 7 tesla*, 26th European Signal Processing Conference (EUSIPCO), 2018.

Developped Python packages

2023   **Bandpy**, Multi-/single agent(s) bandits in Python.
- Design to ease research benchmarks in compliance with the GYM API.
- Include the linear, quadratic and multi-armed bandits with the common associated algorithms.

2020   **Carpet**, Fast-minimization of Total Variation regularized problems.   ⦿ carpet
- Minimize 1d TV regularized problems with neural network.

2019   **HemoLearn**, Multivariate estimation of the HRF from fMRI data.   ⦿ hemolearn
- Disentangle the neurovascular coupling from the neural activation signal in a multivariate fashion for fMRI data.

2018   **pyBOLD**, Univariate estimation of the HRF from fMRI data.   ⦿ pybold
- Disentangle the neurovascular coupling from the neural activation signal in a univariate fashion for fMRI data.

2018   **pysap**, MRI image reconstruction.   ⦿ pysap
- MRI image reconstruction based on Compressed Sensing (CS).