AI R&D Scientist
Machine Learning - Signal Processing - Data Analysis
Etienne de MONTALIVET

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Experience

Research Engineer at CEA (DRT-LETI-Clinatec) — **Grenoble**
AI research on epilepsy forecasting — *June 2021 - Now*

- Real time epilepsy forecasting for closed loop neuromodulation by focal cooling
- Research and develop *soa* algorithms adapted to seizure forecasting based on invasive EEG signals
- Deploy / evaluate real-time forecasting algorithms on the neural interface
- Develop pipelines to work on large amount of data using cloud computing

AI R&D Consulting Engineer at Inventhys — **Annecy**
Embedded Machine/Deep Learning — *Aug 2018 - June 2021*

- Conduct AI research projects in Industry 4.0 and Health
- Develop solutions on micro-controllers/processors (Edge AI)
- Conduct R&D on state-of-the-art algorithms including anomaly detection, predictive maintenance, object detection, classification,...
- Lead teams on AI research projects
- AI workshop trainer for industrial clients

R&D Engineer at ISIR (Sorbonne Université) — **Paris**
Upper limb prosthesis control using AI — *Nov 2015 - Aug 2018*

- Improve the neural interface of the prosthesis using machine/deep Learning
- Analyze / process electro-physiological (EMG) and kinematic (IMU) signals
- Develop documented software librairies (C++, Matlab) for prosthesis control and data analysis
- Collaborate with multiple scientific labs (cf Academic References)
- Participate to the writing of 14 scientific articles (one as 1st author in *IEEE TNSRE*)

Education

ENSTA (Institut Polytechnique de Paris - in the top ten of french engineering schools) — **Paris**
Major in Robotics and Embedded Systems — *2011–2015*
Sciences: Robotics, Statistics, Machine Learning, Computer Vision, Embedded Software

Collège Stanislas — **Paris**
French Classes Préparatoires, Maths Sup - Maths Spé — *2009–2011*

Skills

- **Machine Learning:** Statistics, Clustering, Neural Networks (CNN, AE, LSTM...), Decision Trees,...
- **Signal Processing:** Filtering, Filter design, Wavelets, Cepstrum, ...
- **ML framework:** sklearn, numpy, scipy, opencv, holoviews, Tensorflow, PyTorch, H2O, Optuna,...
- **Programming Languages:** proficient in Python, C, C++ (Qt for UI), Matlab - (see my personal github)
- **Languages:** French (native), English (fluent), German (basic)

Academic References

- **Nathanaël Jarrassé:** Tenured CNRS Researcher in Robotics at ISIR - *jarrasse(at)isir.upmc.fr*
- **Jozina B. de Graaf:** Assoc. Professor at the Faculty of Sport Sciences in Marseille - *jozina.de-graaf(at)univ-amu.fr*
- **Guillaume Morel:** Professor and director at ISIR - *morel(at)isir.upmc.fr*
- **MJ Ortiz Catalan:** Assoc. Professor at Chalmers University of Technology - *maxo(at)chalmers.se*

Hobbies

- History - Lindy Hop - Backpack travelling
- Tennis - Hiking - Swimming - Datascience stackexchange support

Publications

Peer-reviewed journal articles (5)

- E. de Montalivet, K Bailly, A. Touillet, N. Martinet, J. Paysant, and N. Jarrassé. Guiding the training of users with a pattern similarity biofeedback to improve the performance of myoelectric pattern recognition . *IEEE in Transactions on Neural Systems & Rehabilitation Engineering*, 28(8):1–11, 2020
- M. Merad, E. de Montalivet, M. Legrand, E. Mastinu, M. Ortiz-Catalan, A. Touillet, N. Martinet, J. Paysant, A. Roby-Brami, and N. Jarrassé. Assessment of an automatic prosthetic elbow control strategy using residual limb motion for transhumeral amputated individuals with socket or osseointegrated prostheses. *IEEE Transactions on Medical Robotics and Bionics*, 2(1):38–49, 2020
- N. Jarrassé, E. de Montalivet, F. Richer, C. Nicol, A. Touillet, N. Martinet, J. Paysant, and J.B. De Graaf. Phantom-mobility-based prosthesis control in transhumeral amputees without surgical reinnervation: A preliminary study. *Frontiers in bioengineering and biotechnology*, 6:164, 2018
- M. Legrand, M. Merad, E. de Montalivet, A. Roby-Brami, and N. Jarrassé. Movement-based control for upper-limb prosthetics: Is the regression technique the key to a robust and accurate control? *Frontiers in neurorobotics*, 12:41, 2018
- M. Merad, E. de Montalivet, A. Touillet, N. Martinet, A. Roby-Brami, and N. Jarrassé. Can we achieve intuitive prosthetic elbow control based on healthy upper limb motor strategies? *Frontiers in neurorobotics*, 12:1, 2018

Peer-reviewed conference articles (9)

- M. Legrand, E. de Montalivet, F. Richer, N. Jarrassé, and G. Morel. Reciprocal kinematic control: Using human-robot dual adaptation to control upper limb assistive devices. In *Proceedings of the Hamlyn Symposium on Medical Robotics*, page xx, 2019
- E. de Montalivet, K. Bailly, A. Touillet, N. Martinet, J. Paysant, and N. Jarrassé. An optimized visual biofeedback to train users in using prosthesis with pattern recognition myoelectric control. In *34th annual congress of the French Society of Physical Medicine and Reha bilitation (SOFMER)*, page xx, Bordeaux, 2019
- M. Merad, E. de Montalivet, M. Legrand, A. Touillet, Martinet N., J. Paysant, A. Roby-Brami, and N. Jarrassé. Improving the control of prostheses in arm amputees with approaches based on motor coordination. In *Computer Methods in Biomechanics and Biomedical Engineering: Supplement for the International French Society of Biomechanics Conference*, page xx, 2019
- N. Jarrassé, D. Müller, E. de Montalivet, F. Richer, M. Merad, A. Touillet, N. Martinet, and J. Paysant. A simple movement based control approach to ease the control of a myoelectric elbow prosthetics in transhumeral amputees. *Annals of Physical and Rehabilitation Medicine*, 61:e471, 2018
- M. Merad, E. de Montalivet, M. Lestoille, A. Touillet, N. Martinet, J. Paysant, A. Roby-Brami, and N. Jarrassé. Using the body kinematics to assess the utilization of transhumeral prostheses. *Annals of Physical and Rehabilitation Medicine*, 61:e469–e470, 2018
- M. Merad, E. de Montalivet, A. Touillet, M. Ortiz-Catalan, A. Roby-Brami, and N. Jarrassé. Pre-clinical assessment of an intuitive prosthetic elbow control strategy using residual limb motion with osseo-integrated patients. *Annals of Physical and Rehabilitation Medicine*, 60:e100–e101, 2017
- M. Merad, E. de Montalivet, A. Touillet, N. Martinet, A. Roby-Brami, and N. Jarrassé. Pre-clinical evaluation of a natural prosthetic elbow control strategy using residual limb motion and a model of healthy inter-joint coordinations. *Annals of Physical and Rehabilitation Medicine*, 60:e100, 2017
- M. Merad, A. de Montalivet, Eand Roby-Brami, and N. Jarrassé. Intuitive control of a prosthetic elbow. In *Converging Clinical and Engineering Research on Neurorehabilitation II*, pages 483–487. Springer, 2017
- M. Merad, E. de Montalivet, A. Roby-Brami, and N. Jarrassé. Intuitive prosthetic control using upper limb inter-joint coordinations and imu-based shoulder angles measurement: a pilot study. In *2016 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, pages 5677–5682. IEEE, 2016