EDOUARD DUCHESNAY

RESEARCH DIRECTOR IN STATISTICAL MACHINE LEARNING FOR NEUROIMAGING

NeuroSpin, CEA, Paris-Saclay University, France

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Design of machine learning and statistical models to discover brain predictive signatures of psychiatric disorders

Machine Learning – Statistics – Neuroimaging – Scientific computing – Datamanagement

Experience

Research director in statistical machine learning applied to neuroimaging *2008 - Present*

CEA, NEUROSPIN, PARIS-SACLAY UNIVERSITY *France*

Position: team leader of the group *Signatures of brain disorders* at NeuroSpin.

- Scientific Supervision of Ph.D. and post-doc students
- Project supervision as work-package leader or principal investigator of grants

Domains:

- Machine learning and statistical analysis of neuroimaging-genetic data
- Diagnosis/prognosis and biomarkers discovery of brain diseases.
- Deep learning for transfer learning
- Datamanagement of large scale studies in psychiatry including neuroimaging

R&D engineer *2005-2008*

INSERM - "NEUROIMAGING AND PSYCHIATRY" *Orsay, France*

- Project: Design of multivariate discriminant methods applied to biomarkers discovery or early diagnosis of psychiatric disease based on MRI and PET neuroimaging.
- Domain: Machine-learning, multivariate statistics. Brain images (MRI, PET) processing.
- Technical environment: Python, R, CC++, Linux, Matlab.

Postdoctoral fellow in machine learning applied to neuroimaging *2003-2004*

CEA-SHFJ *Orsay, France*

- Project: Design & development of a data mining platform for brain imaging.
- Domain: Classification (Support Vector Machine, statistics) & clustering algorithms; brain images (MRI, PET, fMRI) processing; relational databases.
- Technical environment: Python, R, CC++, SQL, Linux.

Software engineer *2002*

MBD.A (AIRBUS Co.), CONTRACT FOR ASTEK Co. *Velizy, France*

- Project: Object-oriented software design and wrapping of algorithms of missile mission planning.
- Technical environment: CC++, UNIX.

Teaching and research assistant (ATER) *2001-2002*

RENNES 1 UNIVERSITY *Rennes, France*

- Teaching: Computer science, signal & image processing.
- Research: distributed computer vision systems.
- Technical environment: Java, CC++, Linux cluster.

Education

Habilitation (for full professorship) in machine learning applied to neuroimaging *2020*

PARIS-SACLAY UNIVERSITY *Gif/Yvette, France*

Ph.D. in image processing *1999-2001*

RENNES 1 UNIVERSITY, LTSI (LABORATORY OF SIGNAL AND IMAGE PROCESSING) *Rennes, France*

- Distributed Artificial Intelligence for computer vision applied to medical imaging.

Master's degree in signal/image processing *1997-1998*

RENNES 1 UNIVERSITY *Rennes, France*

- Master SISEA (formerly DEA STIR): Signal, image, systèmes embarqués, automatique.

Master's degree in software engineering *1992-1997*

EPITA *Kremelin Bicètre, France*

- École Pour l'Informatique et les Techniques Avancées, Option: SCIA (Sciences Cognitives et Informatique Avancée)

Academic research

Bibliometry

- Publications: $79^*, 131^\dagger$
- Total Number of Citations: $24,576^*, 52,121^\dagger$
- H-Index: $24^*, 29^\dagger$
- *Publons (Web of Science), †Google scholar

Bio (IEEE style)

Edouard Duchesnay is a research director in data science at NeuroSpin, CEA, Paris-Saclay University, France. Since 2003 he is designing machine learning models to discover brain imaging signatures of mental disorders. He explored dimension reduction and regularization strategies to overcome the "curse of dimensionality" caused by a large number of neuroimaging measurements. In 2019, he obtained a chair in Artificial Intelligence to develop transfer learning algorithms to bridge the gap between big (heterogeneous) and small (homogeneous) datasets. He received his Ph.D. in 2001 and M.S. degree in 1998 in signal and image processing from Rennes 1 University (France). In 1997, he received his M.S. degree in software engineering from École Pour l'Informatique et les Techniques Avancées (France).

Five most significant scientific articles

- A. De Pierrefeu, T. Löfstedt, C. Laidi, F. Hadj-Selem, J. Bourgin, T. Hajek, F. Spaniel, M. Kolenic, P. Ciuciu, N. Hamdani, M. Leboyer, T. Fovet, R. Jardri, J. Houenou, **E. Duchesnay** "Identifying a neuroanatomical signature of schizophrenia, reproducible across sites and stages, using machine learning with structured sparsity" In: Acta Psychiatrica Scandinavica, Wiley, 2018, 2018, pp.1 - 10 (PDF)
- A. de Pierrefeu, T. Fovet, F. Hadj-Selem, T. Löfstedt, P. Ciuciu, S. Lefebvre, P. Thomas, R. Lopes, R. Jardri, and **E. Duchesnay**. "Prediction of activation patterns preceding hallucinations in patients with schizophrenia using machine learning with structured sparsity". Human Brain Mapping, Wiley, 2018, 39 (4), pp.1777 - 1788 (PDF)
- F. Hadj-Selem, T. Lofstedt, E. Dohmatob, V. Frouin, M. Dubois, V. Guillemot, and **E. Duchesnay**. "Continuation of Nesterov's Smoothing for Regression with Structured Sparsity in High-Dimensional Neuroimaging". IEEE Transactions on Medical Imaging (PDF) (April 2018) and supplementary
- A. de Pierrefeu, T. Lofstedt, F. Hadj-Selem, M. Dubois, R. Jardri, T. Fovet, P. Ciuciu, V. Frouin, and **E. Duchesnay**. "Structured Sparse Principal Components Analysis With the TV-Elastic Net Penalty". IEEE Transactions on Medical Imaging, 2018, 37 (2), pp.396 - 407 (PDF)
- F. Pedregosa, G. Varoquaux, A. Gramfort, V. Michel, B. Thirion, O. Grisel, M. Blondel, P. Prettenhofer, R. Weiss, V. Dubourg, J. Vanderplas, A. Passos, D. Cournapeau, M. Brucher, M. Perrot, and **E. Duchesnay**. "Scikit-learn: Machine Learning in Python". In: Journal of Machine Learning Research 12.Oct (Jan. 2012)

Grants

- *2020-2024*: Artificial Intelligence (AI) Chair. Big2small Transfer Learning from Big data to Small Data: Leveraging Psychiatric Neuroimaging Biomarkers Discovery. **PI: E Duchesnay**
- *2019-2024*: PsyCARE (RHU). Preventing psychosis through personalized care. PI: MO Krebs,**WP leader: E Duchesnay**, Team budget: 715k€
- *2018-2023*: R-LiNK (H2020-SC1-2017, 754907). Optimizing response to Li treatment through personalized evaluation of individuals with bipolar I disorder: the R-LiNK initiative. PI: F Bellivier, **WP leader: E Duchesnay** and leader for the CEA, Team budget: 800k€
- 2014-2018: BIP-Li7 (ANR-14-CE15-0003). Therapeutic Lithium response in Bipolar Disorders and brain Lithium-7 NMR Spectroscopy Imaging at 7 Tesla. PI: F Bellivier, WP leader: F Boumezbeur, Team budget: 280k€
- *2011-2015*: MESCOG, (FP6 ERA-NET NEURON 01 EW1207). Mechanisms of Small Vessel Related Brain Damage and Cognitive Impairment: Integrating Imaging Findings from Genetic and Sporadic Disease. PI: M Dichgans, **WP co-leader: E Duchesnay**, Team budget: 195k€
- *2012-2016*: BRAINOMICS (ANR-10-BINF-04). Methodological and software solutions for the integration of neuroimaging and genomic data. **WP leader: E Duchesnay**, Team budget: 800k€
- *2010-2013*: Karamétria (ANR-09-BLAN-0332). A unified framework for feature-based morphometry of the brain. **PI: E Duchesnay** with A Roche, Team budget: 200k€
- *2007-2010*: AGIR (ANR-07-NEUR-0001). AGIR – Autism: Genetic and Imaging Research. PI: M. Zilbovicius, **WP leader: E Duchesnay**, Team budget: 150k€
- *2007-Present*: Contribution to the CATI platform which is a national platform created by the French Alzheimer plan in 2011 to support multicenter neuroimaging studies (9M€ grant)

Scientific comity and reviewer activities

Steering committee member of MLCN annual workshop (MICCAI), Machine Learning in Clinical Neuroimaging.

- *Journals:* Biological Psychiatry, NeuroImage, Human Brain Mapping, Medical Image Analysis, IEEE Transactions

on Medical Imaging, International Journal of Biomedical Imaging, PLOS ONE
- *Conferences:* MICCAI, IEEE EMBC, ICCV, IEEE ICASSP, OHBM

Teaching

I wrote a course on Statistics and Machine Learning in Python, github: Jupyter notebooks and python sources and pdf. I deliver lectures on machine learning/statistics in:

- *2019-Now* Introduction to AI: main algorithms of machine learning in Master 2 radiophysique médicale Paris-Saclay University
- *2017-Now* Biostatistics 3rd year of CentralSupelec, Paris-Saclay University, head: Arthur Tenenhaus
- *2018-Now* Machine learning in Master 2 Modelisations Statistiques Economique & Financieres MoSeF, Panthéon Sorbonne Paris 1 University, head: Rania Hentati Kaffel
- *2015-Now* Machine learning in Master 2 Innovation, marché et science des données IMSD, Paris-Saclay University, head: Ekaterina Kalugina
- *2019-2020* Machine learning in 2nd & 3rd years of EPITA, Kremlin-Bicètre, Image processing option, head: Elodie Puybareau and Guillaume Tochon
- *2016-2017* Data analysis in Master 1 Mathématiques et applications, option "Ingénierie mathématique pour les sciences du vivant", Paris Descartes University, head: Etienne Birmele

Supervision experience

Ph.D.

- *2020-now* Robin Louiset together with Pietro Gori and Antoine Grigis
- *2019-now* Anton Iftimovici, together with MO Krebs
- *2019-now* Benoit Dufumier together with Arthur Tenenhaus, Pietro Gori and Antoine Grigis
- *2016-2019* Amicie de Pierrefeu together with Philippe Ciuciu
- *2008-2012* Edith Lefloch is now research scientist at CEA, CNRGH Evry, France
- *2009-2011* Cecilia Damon together with JB Poline

Post-doc

- *2017-now* Pauline Favre, Post-doc, together with JF Mangin and J Houenou
- *2016* Pietro Gori, Post-doc together with JF Mangin and J Houenou. P. Gori is now Assistant Professor at Télécom ParisTech, Paris, France
- *2013-2015* Fouad Hadj Selem is now research scientist at the Energy Transition Institute: VeDeCoM, France
- *2013-2015* Tommy Lofstedt, T. Lofstedt is now associate professor at Umea University, Sweden

Engineer

- *2021-Now* Loic Dorval together with Antoine Grigis
- *2019-Now* Julie Victor together with Antoine Grigis
- *2013-2014* Mathieu Dubois, M. Dubois is now research engineer at CEA Genoscope, Evry, France
- *2013-2014* Jinpeng Li, Research Engineer. J. Li is now data scientist at Alibaba Cloud

Master

- *2014*, Clémence Pinaud, CentralSupelec Engineer trainee. C Pinaud is now engineer at Dreems, Paris
- *2014*, Christophe Launay, EFREI Engineer trainee
- *2009*, Christophe Lalanne, Master 2 BIBS trainee. C. Lalanne is now research engineer at Université Denis Diderot (Paris VII), Paris

Software

E. Duchesnay contributed to the genesis of the machine learning Python library scikit-learn He is now is a core contributor of ParsimonY library a Machine Learning library in Python dedicated to high dimensional structured input data such as brain images (MRI, PET) or genetics data (DNA, RNA).

Publications

Patent

PCT/FR2010/050431: Inventors: **Duchesnay, Edouard**; Paillere, Marie-Laure; Cachia, Arnaud; Martinot, Jean-Luc; Artiges, Eric. "Method for Developing an Information Prediction Device, Use Thereof, and Corresponding Storage Medium and Apparatus".

Journal

[Chi+20] C. R. K. Ching et al. "What We Learn about Bipolar Disorder from Large-Scale Neuroimaging: Findings and Future Directions from the ENIGMA Bipolar Disorder Working Group". In: *Human Brain Mapping* (July 29, 2020).

[Cla+20] L.-A. Claude, J. Houenou, **E. Duchesnay**, and P. Favre. "Will Machine Learning Applied to Neuroimaging in Bipolar Disorder Help the Clinician? A Critical Review and Methodological Suggestions". In: *Bipolar Disorders* (Feb. 28, 2020).

[Hoz+20] F. Hozer, S. Sarrazin, C. Laidi, P. Favre, M. Pauling, D. Cannon, C. McDonald, L. Emsell, J.-F. Mangin, **E. Duchesnay**, M. Bellani, P. Brambilla, M. Wessa, J. Linke, M. Polosan, A. Versace, M. L. Phillips, M. Delavest, F. Bellivier, N. Hamdani, M.-A. d'Albis, M. Leboyer, and J. Houenou. "Lithium Prevents Grey Matter Atrophy in Patients with Bipolar Disorder: An International Multicenter Study". In: *Psychological Medicine* (Jan. 27, 2020), pp. 1–10.

[Man+20] J.-F. Mangin, D. Rivière, **E. Duchesnay**, Y. Cointepas, V. Gaura, C. Verny, P. Damier, P. Krystkowiak, A.-C. Bachoud-Lévi, P. Hantraye, P. Remy, and G. Douaud. "Neocortical Morphometry in Huntington's Disease: Indication of the Coexistence of Abnormal Neurodevelopmental and Neurodegenerative Processes". In: *NeuroImage. Clinical* 26 (Feb. 13, 2020), p. 102211.

[Sto+20] J. Stout, F. Hozer, A. Coste, F. Mauconduit, N. Djebrani-Oussedik, S. Sarrazin, J. Poupon, M. Meyrel, S. Romanzetti, B. Etain, C. Rabrait-Lerman, J. Houenou, F. Bellivier, **E. Duchesnay**, and F. Boumezbeur. "Accumulation of Lithium in the Hippocampus of Patients With Bipolar Disorder: A Lithium-7 Magnetic Resonance Imaging Study at 7 Tesla". In: *Biological Psychiatry* 88.5 (Sept. 1, 2020), pp. 426–433.

[Bou+19] J. Bourgin, **E. Duchesnay**, E. Magaud, R. Gaillard, M. Kazes, and M.-O. Krebs. "Predicting the Individual Risk of Psychosis Conversion in At-Risk Mental State (ARMS): A Multivariate Model Reveals the Influence of Nonpsychotic Prodromal Symptoms". In: *European Child & Adolescent Psychiatry* (Dec. 23, 2019).

[Fav+19a] P. Favre, M. Pauling, J. Stout, F. Hozer, S. Sarrazin, C. Abé, M. Alda, C. Alloza, S. Alonso-Lana, O. A. Andreassen, B. T. Baune, F. Benedetti, G. F. Busatto, E. J. Canales-Rodríguez, X. Caseras, T. M. Chaim-Avancini, C. R. K. Ching, U. Dannlowski, M. Deppe, L. T. Eyler, M. Fatjo-Vilas, S. F. Foley, D. Grotegerd, T. Hajek, U. K. Haukvik, F. M. Howells, N. Jahanshad, H. Kugel, T. V. Lagerberg, S. M. Lawrie, J. O. Linke, A. McIntosh, E. M. T. Melloni, P. B. Mitchell, M. Polosan, E. Pomarol-Clotet, J. Repple, G. Roberts, A. Roos, P. G. P. Rosa, R. Salvador, S. Sarró, P. R. Schofield, M. H. Serpa, K. Sim, D. J. Stein, J. E. Sussmann, H. S. Temmingh, P. M. Thompson, N. Verdolini, E. Vieta, M. Wessa, H. C. Whalley, M. V. Zanetti, M. Leboyer, J.-F. Mangin, C. Henry, **E. Duchesnay**, and J. Houenou. "Widespread White Matter Microstructural Abnormalities in Bipolar Disorder: Evidence from Mega- and Meta-Analyses across 3033 Individuals". In: *Neuropsychopharmacology* (Aug. 21, 2019), pp. 1–11.

[Fav+19b] P. Favre, M. Pauling, J. Stout, F. Hozer, S. Sarrazin, C. Abé, M. Alda, C. Alloza, S. Alonso-Lana, O. A. Andreassen, B. T. Baune, F. Benedetti, G. F. Busatto, E. J. Canales-Rodríguez, X. Caseras, T. M. Chaim-Avancini, C. R. K. Ching, U. Dannlowski, M. Deppe, L. T. Eyler, M. Fatjo-Vilas, S. F. Foley, D. Grotegerd, T. Hajek, U. K. Haukvik, F. M. Howells, N. Jahanshad, H. Kugel, T. V. Lagerberg, S. M. Lawrie, J. O. Linke, A. McIntosh, E. M. T. Melloni, P. B. Mitchell, M. Polosan, E. Pomarol-Clotet, J. Repple, G. Roberts, A. Roos, P. G. P. Rosa, R. Salvador, S. Sarró, P. R. Schofield, M. H. Serpa, K. Sim, D. J. Stein, J. E. Sussmann, H. S. Temmingh, P. M. Thompson, N. Verdolini, E. Vieta, M. Wessa, H. C. Whalley, M. V. Zanetti, M. Leboyer, J.-F. Mangin, C. Henry, **E. Duchesnay**, J. Houenou, and ENIGMA Bipolar Disorder Working Group. "Correction: Widespread White Matter Microstructural Abnormalities in Bipolar Disorder: Evidence from Mega- and Meta-Analyses across 3033 Individuals". In: *Neuropsychopharmacology: Official Publication of the American College of Neuropsychopharmacology* 44.13 (Dec. 2019), p. 2298.

[Fav+19c] P. Favre, M. Pauling, J. Stout, F. Hozer, S. Sarrazin, C. Abé, M. Alda, C. Alloza, S. Alonso-Lana, O. A. Andreassen, B. T. Baune, F. Benedetti, G. F. Busatto, E. J. Canales-Rodríguez, X. Caseras, T. M. Chaim-Avancini, C. R. K. Ching, U. Dannlowski, M. Deppe, L. T. Eyler, M. Fatjo-Vilas, S. F. Foley, D. Grotegerd, T. Hajek, U. K. Haukvik, F. M. Howells, N. Jahanshad, H. Kugel, T. V. Lagerberg, S. M. Lawrie, J. O. Linke, A. McIntosh, E. M. T. Melloni, P. B. Mitchell, M. Polosan, E. Pomarol-Clotet, J. Repple, G. Roberts, A. Roos, P. G. P. Rosa, R. Salvador, S. Sarró, P. R. Schofield, M. H. Serpa, K. Sim, D. J. Stein, J. E. Sussmann, H. S. Temmingh, P. M. Thompson, N. Verdolini, E. Vieta, M. Wessa, H. C. Whalley, M. V. Zanetti,

M. Leboyer, J.-F. Mangin, C. Henry, **E. Duchesnay**, J. Houenou, and ENIGMA Bipolar Disorder Working Group. "Widespread White Matter Microstructural Abnormalities in Bipolar Disorder: Evidence from Mega- and Meta-Analyses across 3033 Individuals". In: *Neuropsychopharmacology: Official Publication of the American College of Neuropsychopharmacology* 44.13 (Dec. 2019), pp. 2285–2293.

[Lai+19a] C. Laidi, T. Hajek, F. Spaniel, M. Kolenic, M.-A. d'Albis, S. Sarrazin, J.-F. Mangin, **E. Duchesnay**, P. Brambilla, M. Wessa, J. Linke, M. Polosan, P. Favre, A. L. Versace, M. L. Phillips, J. V. Manjon, J. E. Romero, F. Hozer, M. Leboyer, P. Coupe, and J. Houenou. "Cerebellar Parcellation in Schizophrenia and Bipolar Disorder". In: *Acta Psychiatrica Scandinavica* 140.5 (Nov. 2019), pp. 468–476.

[Lai+19b] C. Laidi, T. Hajek, F. Spaniel, M. Kolenic, M.-A. d'Albis, S. Sarrazin, J.-F. Mangin, **E. Duchesnay**, P. Brambilla, M. Wessa, J. Linke, M. Polosan, P. Favre, A. L. Versace, M. L. Phillips, J. V. Manjon, J. E. Romero, F. Hozer, M. Leboyer, P. Coupe, and J. Houenou. "Cerebellar Parcellation in Schizophrenia and Bipolar Disorder". In: *Acta Psychiatrica Scandinavica* 140.5 (Nov. 2019), pp. 468–476.

[Lai+19c] C. Laidi, J. Boisgontier, A. de Pierrefeu, **E. Duchesnay**, S. Hotier, M.-A. d'Albis, R. Delorme, F. Bolognani, C. Czech, C. Bouquet, A. Amestoy, J. Petit, Š. Holiga, J. Dukart, A. Gaman, E. Toledano, M. Ly-Le Moal, I. Scheid, M. Leboyer, and J. Houenou. "Decreased Cortical Thickness in the Anterior Cingulate Cortex in Adults with Autism". In: *Journal of Autism and Developmental Disorders* 49.4 (Apr. 2019), pp. 1402–1409.

[Sco+19a] J. Scott, D. Hidalgo-Mazzei, R. Strawbridge, A. Young, M. Resche-Rigon, B. Etain, O. A. Andreassen, M. Bauer, D. Bennabi, A. M. Blamire, F. Boumezbeur, P. Brambilla, N. Cattane, A. Cattaneo, M. Chupin, K. Coello, Y. Cointepas, F. Colom, D. A. Cousins, C. Dubertret, **E. Duchesnay**, A. Ferro, A. Garcia-Estela, J. Goikolea, A. Grigis, E. Haffen, M. C. Høegh, P. Jakobsen, J. L. Kalman, L. V. Kessing, F. Klohn-Saghatolislam, T. V. Lagerberg, M. Landén, U. Lewitzka, A. Lutticke, N. Mazer, M. Mazzelli, C. Mora, T. Muller, E. Mur-Mila, K. J. Oedegaard, L. Oltedal, E. Pålsson, D. Papadopoulos Orfanos, S. Papiol, V. Perez-Sola, A. Reif, P. Ritter, R. Rossi, T. Schulze, F. Senner, F. E. Smith, L. Squarcina, N. E. Steen, P. E. Thelwall, C. Varo, E. Vieta, M. Vinberg, M. Wessa, L. T. Westlye, and F. Bellivier. "Prospective Cohort Study of Early Biosignatures of Response to Lithium in Bipolar-I-Disorders: Overview of the H2020-Funded R-LiNK Initiative". In: *International Journal of Bipolar Disorders* 7.1 (Sept. 25, 2019), p. 20.

[Sco+19b] J. Scott, D. Hidalgo-Mazzei, R. Strawbridge, A. Young, M. Resche-Rigon, B. Etain, O. A. Andreassen, M. Bauer, D. Bennabi, A. M. Blamire, F. Boumezbeur, P. Brambilla, N. Cattane, A. Cattaneo, M. Chupin, K. Coello, Y. Cointepas, F. Colom, D. A. Cousins, C. Dubertret, **E. Duchesnay**, A. Ferro, A. Garcia-Estela, J. Goikolea, A. Grigis, E. Haffen, M. C. Høegh, P. Jakobsen, J. L. Kalman, L. V. Kessing, F. Klohn-Saghatolislam, T. V. Lagerberg, M. Landén, U. Lewitzka, A. Lutticke, N. Mazer, M. Mazzelli, C. Mora, T. Muller, E. Mur-Mila, K. J. Oedegaard, L. Oltedal, E. Pålsson, D. Papadopoulos Orfanos, S. Papiol, V. Perez-Sola, A. Reif, P. Ritter, R. Rossi, T. Schulze, F. Senner, F. E. Smith, L. Squarcina, N. E. Steen, P. E. Thelwall, C. Varo, E. Vieta, M. Vinberg, M. Wessa, L. T. Westlye, and F. Bellivier. "Prospective Cohort Study of Early Biosignatures of Response to Lithium in Bipolar-I-Disorders: Overview of the H2020-Funded R-LiNK Initiative". In: *International Journal of Bipolar Disorders* 7.1 (Sept. 25, 2019), p. 20.

[dPie+18a] A. de Pierrefeu, T. Löfstedt, C. Laidi, F. Hadj-Selem, J. Bourgin, T. Hajek, F. Spaniel, M. Kolenic, P. Ciuciu, N. Hamdani, M. Leboyer, T. Fovet, R. Jardri, J. Houenou, and **E. Duchesnay**. "Identifying a Neuroanatomical Signature of Schizophrenia, Reproducible across Sites and Stages, Using Machine Learning with Structured Sparsity". In: *Acta Psychiatrica Scandinavica* 0.0 (2018).

[dPie+18b] A. de Pierrefeu, T. Fovet, F. Hadj-Selem, T. Löfstedt, P. Ciuciu, S. Lefebvre, P. Thomas, R. Lopes, R. Jardri, and **E. Duchesnay**. "Prediction of Activation Patterns Preceding Hallucinations in Patients with Schizophrenia Using Machine Learning with Structured Sparsity". In: *Human Brain Mapping* 39.4 (Apr. 1, 2018), pp. 1777–1788.

[dPie+18c] A. de Pierrefeu, T. Lofstedt, F. Hadj-Selem, M. Dubois, R. Jardri, T. Fovet, P. Ciuciu, V. Frouin, and **E. Duchesnay**. "Structured Sparse Principal Components Analysis With the TV-Elastic Net Penalty". In: *IEEE Transactions on Medical Imaging* 37.2 (Feb. 2018), pp. 396–407.

[Duc+18] **E. Duchesnay**, F. Hadj Selem, F. De Guio, M. Dubois, J.-F. Mangin, M. Duering, S. Ropele, R. Schmidt, M. Dichgans, H. Chabriat, and E. Jouvent. "Different Types of White Matter Hyperintensities in CADASIL". In: *Frontiers in Neurology* 9 (2018).

[Had+18a] F. Hadj-Selem, T. Löfstedt, E. Dohmatob, V. Frouin, M. Dubois, V. Guillemot, and **E. Duchesnay**. "Continuation of Nesterov's Smoothing for Regression With Structured Sparsity in High-Dimensional Neuroimaging". In: *IEEE Transactions on Medical Imaging* 37.11 (Nov. 2018), pp. 2403–2413.

[Leb+18] J. Lebenberg, M. Labit, G. Auzias, H. Mohlberg, C. Fischer, D. Rivière, **E. Duchesnay**, C. Kabdebon, F. Leroy, N. Labra, F. Poupon, T. Dickscheid, L. Hertz-Pannier, C. Poupon, G. Dehaene-Lambertz, P. Hüppi, K. Amunts, J. Dubois, and J.-F. Mangin. "A Framework Based on Sulcal Constraints to Align Preterm, Infant and Adult Human Brain Images Acquired in Vivo and Post Mortem". In: *Brain Structure & Function* 223.9 (Dec. 2018), pp. 4153–4168.

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Invited presentations, keynotes, and course (sample),

- *2020/09*, Kick-Off Chaires IA Big2small project.
- *2020/09*, Work packages 2 et 4 du projet PsyCARE, JIPEJAAD 2020, Institut de Psychiatrie.
- *2018/10*, Apprentissage automatique multivarié en neuroimagerie. Cycle de conférences de FondaMental 2017-2018 - Psychiatrie numérique : Des outils connectés aux outils interventionnels.
- *2018/03*, Amicie de Pierrefeu, Finale du concours MT180 2018 de l'Université Paris-Saclay
- *2017/11*, EPITA Research & Development Laboratory (LRDE), Le Kremelin-Bicètre, France. "Apprentissage automatique en neuroimagerie: application aux maladies cérébrales"
- *2017/11*, 6 ème Forum de l'Institut de Psychiatrie, Centre Cyceron , Caen, France. "Multivariate Machine Learning in Neuroimaging: Application to Psychiatric Disorders".
- *2017/07*, International School for Translational Psychiatry - Trans-Psy, Pasteur, Paris, France. "Machine learning approaches in neuroimaging"
- *2016/11*, CERF - Collège des Enseignants en Radiologie de France, Paris, France. "Avancées en analyses d'images, big data et machine learning"
- *2014/09/25*, la séance solennelle au Collège de France sur "Imagerie cérébrale et psychiatrie", Paris, France. "Multivariate Machine Learning In Neuroimaging".
- *2013/04*, European Congress of Psychiatry (EPA), Nice, "Methods for Neuroimaging-based biomarkers discovery in psychiatry"
- *2011/11/9*, Machine Learning for NeuroImaging Workshop, Marseille, France. "Application of ML to bridge the gap between clinic and genetics using neuroimaging as an intermediate phenotype"
- *2008/06/04*, ANGD, Strasbourg. "Comparaison d'images: Analyse de groupe et classification".
- *2007/05*, FMRIB seminars, Oxford UK, "Classification applied to brain imaging".
- *2007/05*, IBM T.J. Watson Research Center, Yorktown Heights, NY 10598, "Classification applied to brain imaging Methods & Experiments at NeuroSpin".
- *2007/04*, Workshop on classification organized by Frackowiak R., ENS, Paris.
- *2006/11*, Journée d'IRM fonctionnelle de Marseille organized by F.-X. ALARIO. "Méthodologie pour l'analyse intergroupe en neuroimagerie : distances inter-sujet et classification. Perspectives pour l'aide au diagnostic"
- *2006/09*, Journées Inter-régionales de formation en Neuro-Imagerie, Paris, "Classification basée sur les images d'IRM fonctionnelle : méthode et expérimentation sur le cortex visuel"
- *2006/05*, Ecole d'imagerie anatomique, Paris, "Datamining in neuroimagery"