

VINCENT GRIPON

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Permanent researcher HDR (*chargé de recherche*) with IMT-Atlantique.

IEEE Senior Member.

keywords: artificial intelligence, deep learning, efficient implementations, graphical models, graph signal processing, binary neural networks

Community Involvement

- **Associate Editor**—IEEE Transactions on Signal Processing
Since June 2019.
- **Guest Editor**—IEEE Transactions of Signal and Information Processing over Networks
“Network Topology Inference”, 2019.
- **Special Sessions and workshops**—Conferences
Organizer or co-organizer.
 - “Hardware Aware Efficient Training”, ICLR 2021.
 - “Deep Learning for Graphs”, SIAM SDM 2019.
 - “Informational Neurosciences”, Cognitive 2017.
 - “Machine Learning and Coding”, IEEE ISTC 2016.
 - “Séminaire IA et Éthique”, IMT Atlantique, 2021.
 - “Hardware Aware Efficient Training”, ICLR 2021.
- **Seminars**—Organizer
NeuroSTIC (100-200 participants) each year since 2016.
- **Technical Program Committee**—Member
IEEE EUSIPCO and IEEE GlobalSIP.
- **Jury in IEEE Xtreme**—From 2013
I propose one exercise each year.
- **PhD Thesis Committee**—Examiner
 - George Stamatescu, University of Adelaide, 2020.
 - Guillaume Hocquet, Université Paris-Saclay, 2021.
- **Other Jury and Committees**—
 - Assistant Professor positions, Machine Learning, École Centrale de Nantes, 2020.
 - Assistant Professor position, Machine Learning and Signal Processing (Section 61), Université Côte d’Azur, 2021.
 - Doctoral Fellowships, Signal Processing, École Doctorale de l’Institut Polytechnique de Paris, 2021.
- **Interviewer at the ENS (Paris-Saclay, Lyon, Rennes) competitive examination in “fundamental computer science”**—ENS Ulm
2015, 2016, 2017.

- **Interviewer at the ENS (Paris-Saclay, Lyon, Rennes) competitive examination in “practical evaluation”**—ENS Lyon
2018.
- **Reviewer**—Journals
IEEE Transactions on Neural Networks and Learning Systems, IEEE Transactions on Signal Processing, IEEE Transactions on Signal and Information Processing over Networks, Journal of Machine Learning Research, Information Sciences, Journal of Selected Topics in Signal Processing, Neural Computation, IEEE Transactions on Circuits and Systems, IEEE Transactions on Information Forensics and Security, IEEE Transactions on Information Theory, Mathematical and Computational Applications, Artificial Intelligence.
- **Reviewer**—Conferences
IEEE ISTC, IEEE GlobalSIP, IEEE DSW, IEEE EUSIPCO, GretsI, GSP.
- **Reviewer**—French National Research Agency.
2020.

Education

- **ENS Lyon, France**—DAPI
Direction of Research Habilitation (HDR) in Computer Science
 - “Efficient Representations of Graph and Neural Network Signals”, defended on Dec. 4th, 2020.
 - * **Director of the jury:** Rémi Gribonval, Senior Research Scientist at INRIA
 - * **Reviewers:**
 - Sophie Achard, Senior Research Scientist at CNRS
 - Pascal Frossard, Professor at EPFL
 - Julie Grollier, Senior Research Scientist at CNRS/Thales
 - * **Examiners:**
 - Sébastien Lefèvre, Professor at Université Bretagne Sud
 - Antonio Ortega, Professor at University of Southern California
- **IMT Atlantique, Brest, France**—Electronics department
Ph.D. in communication and information sciences.
 - “Networks of Neural Cliques”, defended on July 20th, 2011.
 - * **Director of the jury:** Claude Jard, Professor at ENS Paris-Saclay
 - * **Reviewers:**
 - David Declercq, Professor at ENSEA
 - Bernard Victorri, Senior Research Scientist at CNRS
 - * **Examiners:**
 - Rodolphe Héliot, Research Scientist at CEA-LETI
 - Yann Le Cun, Professor at New-York University
 - Franck Vermet, Professor at University of Brest
 - François Vialatte, Professor at ESPCI ParisTech
 - * **Supervisors:**
 - Claude Berrou, Professor at IMT Atlantique

· Jean-Pierre Nadal, Senior Research Scientist at CNRS

- **École Normale Supérieure de Paris Saclay & Université de Rennes 1**—Computer Science *Magistère in Computer Science and Telecommunication*.
 - Licence degree (bachelor) in Computer Science, Session 2006.
 - Master of science first degree in Computer Science, Session 2007.
 - Master of science second degree in Computer Science, Session 2008.
- Ranked 8th at the *ENS Paris-Saclay (École Normale Supérieure de Paris-Saclay)* national competitive examination, Session 2005.

Prices

- **2015 - Best paper award**—Cognitive 2015
“Automatic face recognition using SIFT and networks of neural cliques”
- **2017 - Best paper award**—Cognitive 2017
“Finding all matches in a database using binary neural networks”
- **2019 - Best PhD price from Fondation Mines-Telecom to my student Ghouthi Boukli Hacene**—2019
“Processing and learning deep neural networks on chip”
- **2019 - Best PhD price from Association Francaise pour l’Intelligence Artificielle to my student Ghouthi Boukli Hacene**—2019
“Processing and learning deep neural networks on chip”
- **2020 - Winner of the NIC track of the Continual Learning Challenge**—Continual Learning Challenge, CVPR 2020
“Online Transfer Learning using Logistic Regression and Rehearsal”

Previous experience

- **Permanent researcher**—Artificial Intelligence
Permanent researcher with Institut Mines-Télécom since 2013.
- **Invited Professor**—Artificial Intelligence
Invited professor at Mila/Université de Montréal, 2018-2019.
- **Chair of Excellence**—Artificial Intelligence
Recipient of a University Chair of Excellence at Université Côte d’Azur, 2020.
- **Postdoc**—Computational neuroscience
Postdoc in the ERC advanced grant team NeuCod under the supervision of Professor Claude Berrou, 2012-2013.
- **Postdoc**—Information theory, gossip algorithms and neural networks
Postdoc at McGill University in collaboration with Professors Warren J. Gross and Michael Rabbat, 2011-2012.
- **Merit scholarship Ph.D.**—Networks of neural cliques
Ph.D. under the direction of Claude Berrou at Télécom Bretagne, 2009-2011.
- **Merit Scholarship student**—Computer science Master of Science at ENS Paris Saclay
2005-2009

- **2009 research internship**—Coding and neural network
Ten months internship with Claude Berrou from Télécom-Bretagne (Brest, France).
- **2008 research internship**—Games with imperfect information
Five months internship with Olivier Serre from the Laboratoire d'Informatique Algorithmique: Fondements et Applications (LIAFA) (Paris, France).
- **2007 research internship**—Geolocalization based on WiFi hot points
Three months work with Frederic Vexo from the Virtual Reality Laboratory (VRLab) of the Ecole Polytechnique Fédérale de Lausanne (EPFL) (Switzerland).
- **Master of science project**—Java Detection of Attacks and Intrusions (JeDAI)
Project manager (12 people involved) of one year realized in the University of Rennes I.
- **2006 research internship**—Analysing criteriums on turbo codes interleavers
Two months work done with Claude Berrou (inventor of turbo codes) at Telecom Bretagne.

Visiting scientist

- **As host**—
 - Michael Rabbat, Associate Professor with McGill University (4 months in 2012)
- **As guest**—
 - Tartu University, Estonia (1 week, 2013)
 - McGill University, Canada (multiple times)
 - EPFL, Switzerland (2 weeks, 2014)
 - ENS Lyon, France (1 week, 2015)
 - Brown University, France (1 week, 2015)
 - USC, USA (1 week, 2017)
 - Invited professor at Mila/Université de Montréal, (1 year, 2018-2019)

Summer School Lecturer

- **Associative Memories**—BIOCOMP Summer School, 3h
2017, Roscoff

Research supervising

- **Ph.D. thesis**—
 - Bartosz Bogulawski, joint Ph.D. between Télécom Bretagne and CEA-Leti.
Became a permanent researcher with Schneider.
 - Ala Aboudib, Télécom Bretagne.
Became a Postdoc at College de France then head of AI with TheContillery.
 - Philippe Tigréat, Télécom Bretagne.
Became a data scientist.
 - Robin Danilo, joint Ph.D. between Télécom Bretagne and University of South Brittany.
Became a teacher.
 - Bastien Pasdeloup, IMT Atlantique.
Became a postdoc with EPFL then a Professor with IMT Atlantique.
 - Jean-Charles Vialatte, IMT Atlantique.
Became a permanent researcher with SenX.

- Ghouthi Boukli Hacène, IMT Atlantique.
Obtained the Price for the best PhD in AI 2020, given by Association Française pour l'Intelligence Artificielle, and the price for the best PhD in 2020 from Institut Mines Telecom. Became a post-doc with Yoshua Bengio.
- Carlos Rosar Kos Lassance, IMT Atlantique.
Became a Research Scientist with Naver Labs, Grenoble.
- Myriam Bontonou, third year, IMT Atlantique.
- Yuqing Hu, second year, IMT Atlantique and Orange Labs.
- Hugo Tessier, second year, IMT Atlantique and PSA.
- Raphaël Baéna, first year, IMT Atlantique.
- **Ph.D. thesis committee—**
 - Pierre-Emmanuel Novac, Université Côte d'Azur, supervised by Benoit Miramond and Alain Pegatoquet
 - Simon Benaichouche, IMT Atlantique, supervised by Ronan Fablet and Francois Rousseau
 - Yacouba Kaloga, ENS Lyon, supervised by Pierre Borgnat

Books

1. V. G. C. Lassance and G. B. Hacene, “DecisiveNets: Training Deep Associative Memories to Solve Complex Machine Learning Problems,” ArXiv Preprint, 2020.
2. B. Paskdeloup, V. Gripon, R. Alami and M. Rabbat, “Uncertainty Principle on Graphs,” L. Stankovic and E. Sejdic, *Vertex-Frequency Analysis of Graph Signals*, pp. 317–340, April 2019.
3. C. Berrou and V. Gripon, “Petite mathématique du cerveau,” Odile Jacob, September 2012.

Journal Papers

1. C. L. V. Gripon and A. Ortega, “Laplacian networks: Bounding indicator function smoothness for neural networks robustness,” in *APSIPA Transactions on Signal and Information Processing*, Volume 10, 2021.
2. M. B. L. Béthune and V. Gripon, “Predicting the Generalization Ability of a Few-Shot Classifier,” in *Information*, Volume 12, Number 1, 2021.
3. P. N. G. B. H. A. P. B. Miramond and V. Gripon, “Quantization and Deployment of Deep Neural Networks on Microcontrollers,” in *Sensors*, Volume 21, Number 9, 2021.
4. C. L. V. Gripon and A. Ortega, “Representing Deep Neural Networks Latent Space Geometries with Graphs,” in *Algorithms*, Volume 14, Number 2, 2021.
5. C. L. Y. L. R. G. V. Gripon and I. Reid, “Improved Visual Localization via Graph Filtering,” in *Journal of Imaging*, Volume 7, Number 2, 2021.
6. V. G. M. Löwe and F. Vermet, “Some Remarks on Replicated Simulated Annealing,” in *Journal of Statistical Physics*, Volume 182, Number 3, pp. 1–22, 2021.
7. G. C. G. B. Hacene and V. Gripon, “ThriftyNets: Convolutional Neural Networks with Tiny Parameter Budget,” in *IoT*, Volume 2, Number 2, 2021.
8. G. L. V. G. A. B. F. Rousseau and N. Farrugia, “Gradients of connectivity as graph Fourier bases of brain activity ,” in *Network Neuroscience*, Volume 5, Number 2, pp. 322–336, March 2021.

9. G. B. Hacene, V. Gripon, N. Farrugia, M. Arzel and M. Jezequel, "Transfer Incremental Learning Using Data Augmentation," in *Applied Sciences*, Volume 8, Number 12, 2018.
10. A. Iscen, T. Furon, V. Gripon, M. Rabbat and H. Jégou, "Memory vectors for similarity search in high-dimensional spaces," in *IEEE Transactions on Big Data*, pp. 65–77, 2018.
11. V. Gripon, M. Löwe and F. Vermet, "Associative Memories to Accelerate Approximate Nearest Neighbor Search," in *Applied Sciences*, Volume 8, Number 9, September 2018.
12. A. Mheich, M. Hassan, M. Khalil, V. Gripon, O. Dufor and F. Wendling, "SimiNet: a Novel Method for Quantifying Brain Network Similarity," in *IEEE Transactions on Pattern Analysis and Machine Intelligence*, Volume 40, Number 9, pp. 2238–2249, September 2018.
13. B. Padeloup, V. Gripon, G. Mercier, D. Pastor and M. Rabbat, "Characterization and Inference of Graph Diffusion Processes from Observations of Stationary Signals," in *IEEE Transactions on Signal and Information Processing over Networks*, Volume 4, Number 3, pp. 481–496, September 2018.
14. H. Jarollahi, V. Gripon, N. Onizawa and W. J. Gross, "Algorithm and Architecture for a Low-Power Content-Addressable Memory Based on Sparse-Clustered Networks," in *Transactions on Very Large Scale Integration Systems*, Volume 27, Number 2, pp. 375–387, 2016.
15. X. Jiang, V. Gripon, C. Berrou and M. Rabbat, "Storing sequences in binary tournament-based neural networks," in *IEEE Transactions on Neural Networks and Learning Systems*, Volume 27, Number 5, pp. 913–925, 2016.
16. B. Boguslawski, V. Gripon, F. Seguin and F. Heitzmann, "Twin Neurons for Efficient Real-World Data Distribution in Networks of Neural Cliques. Applications in Power Management in Electronic circuits," in *IEEE Transactions on Neural Networks and Learning Systems*, Volume 27, Number 2, pp. 375–387, 2016.
17. V. Gripon, J. Heusel, M. Löwe and F. Vermet, "A Comparative Study of Sparse Associative Memories," in *Journal of Statistical Physics*, Volume 164, pp. 105–129, 2016.
18. A. Aboudib, V. Gripon and G. Coppin, "A Biologically Inspired Framework for Visual Information Processing and an Application on Modeling Bottom-Up Visual Attention," in *Cognitive Computation*, pp. 1–20, September 2016.
19. G. Soulié, V. Gripon and M. Robert, "Compression of Deep Neural Networks on the Fly," in *Lecture Notes in Computer Science*, Volume 9887, pp. 153–170, September 2016.
20. A. Aboudib, V. Gripon and G. Coppin, "A Neural Network Model for Solving the Feature Correspondence Problem," in *Lecture Notes in Computer Science*, Volume 9887, pp. 439–446, September 2016.
21. F. Leduc-Primeau, V. Gripon, M. Rabbat and W. J. Gross, "Fault-Tolerant Associative Memories Based on c-Partite Graphs," in *IEEE Transactions on Signal Processing*, Volume 64, Number 4, pp. 829–841, 2015.
22. B. K. Aliabadi, C. Berrou, V. Gripon and X. Jiang, "Storing sparse messages in networks of neural cliques," in *IEEE Transactions on Neural Networks and Learning Systems*, Volume 25, pp. 980–989, 2014.
23. H. Jarollahi, N. Onizawa, V. Gripon and W. J. Gross, "Algorithm and Architecture of Fully-Parallel Associative Memories Based on Sparse Clustered Networks," in *Journal of Signal Processing Systems*, pp. 1–13, 2014.

24. H. Jarollahi, N. Onizawa, V. Gripon, N. Sakimura, T. Sugibayashi, T. Endoh, H. Ohno, T. Hanyu and W. J. Gross, “A Non-Volatile Associative Memory-Based Context-Driven Search Engine Using 90 nm CMOS MTJ-Hybrid Logic-in-Memory Architecture,” in *Journal on Emerging and Selected Topics in Circuits and Systems*, Volume 4, pp. 460–474, 2014.
25. V. Gripon and C. Berrou, “Sparse neural networks with large learning diversity,” in *IEEE Transactions on Neural Networks*, Volume 22, Number 7, pp. 1087–1096, July 2011.

Conference Proceedings

1. Y. H. V. Gripon and S. Pateux, “Graph-based Interpolation of Feature Vectors for Accurate Few-Shot Classification,” in *25th International Conference on Pattern Recognition (ICPR)*, pp. 8164–8171, 2021.
2. M. H. C. L. Y. H. L. D. B. Padeloup and V. Gripon, “Improving Classification Accuracy with Graph Filtering,” in *ArXiv Preprint*, 2021.
3. R. B. L. Drumetz and V. Gripon, “Inferring Graph Signal Translations as Invariant Transformations for Classification Tasks,” in *ArXiv Preprint*, 2021.
4. M. Léonardon and V. Gripon, “Using Deep Neural Networks to Predict and Improve the Performance of Polar Codes,” in *ArXiv Preprint*, 2021.
5. T. G. V. G. M. Löwe and F. Vermet, “Towards an Intrinsic Definition of Robustness for a Classifier,” in *IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP)*, pp. 4015–4019, 2021.
6. G. B. Hacene, V. Gripon, M. Arzel, N. Farrugia and Y. Bengio, “Quantized Guided Pruning for Efficient Hardware Implementations of Convolutional Neural Networks,” in *18th IEEE International New Circuits and Systems Conference (NEWCAS)*, pp. 206–209, 2020.
7. C. Lassance, M. Bontonou, G. B. Hacene, V. Gripon, J. Tang and A. Ortega, “Deep geometric knowledge distillation with graphs,” in *IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP)*, pp. 8484–8488, 2020.
8. G. B. Hacene, C. Lassance, V. Gripon, M. Courbariaux and Y. Bengio, “Attention Based Pruning for Shift Networks,” in *25th International Conference on Pattern Recognition (ICPR)*, pp. 4054–4061, 2020.
9. M. Nikolić, G. B. Hacene, C. Bannon, A. D. Lascorz, M. Courbariaux, Y. Bengio, V. Gripon and A. Moshovos, “BitPruning: Learning Bitlengths for Aggressive and Accurate Quantization,” in *ArXiv Preprint: 2002.03090*, 2020.
10. M. N. G. B. H. C. B. A. D. L. M. C. Y. B. V. Gripon and A. Moshovos, “BitPruning: Learning Bitlengths for Aggressive and Accurate Quantization,” in *ArXiv Preprint*, 2020.
11. Y. H. V. Gripon and S. Pateux, “Leveraging the Feature Distribution in Transfer-based Few-Shot Learning,” in *ArXiv Preprint*, 2020.
12. M. B. L. Béthune and V. Gripon, “Predicting the Accuracy of a Few-Shot Classifier,” in *ArXiv Preprint*, 2020.
13. C. L. V. Gripon and G. Mateos, “Graph topology inference benchmarks for machine learning,” in *IEEE 30th International Workshop on Machine Learning for Signal Processing (MLSP)*, pp. 1–6, 2020.
14. M. B. G. L. N. Farrugia and V. Gripon, “Few-shot Decoding of Brain Activation Maps,” in *ArXiv Preprint*, 2020.

15. L. K. V. Gripon and B. Miramond, "GPU-based Self-Organizing Maps for Post-Labeled Few-Shot Unsupervised Learning," in *International Conference on Neural Information Processing*, pp. 404–416, 2020.
16. H. T. V. G. M. L. M. A. T. Hannagan and D. Bertrand, "Rethinking Weight Decay For Efficient Neural Network Pruning," in *ArXiv Preprint*, 2020.
17. C. L. L. B. M. B. M. Hamidouche and V. Gripon, "Ranking Deep Learning Generalization using Label Variation in Latent Geometry Graphs," in *ArXiv Preprint*, 2020.
18. C. Lassance, Y. Latif, R. Garg, V. Gripon and I. Reid, "Improved Visual Localization via Graph Smoothing," in *ArXiv Preprint*, 2019.
19. G. B. Hacene, V. Gripon, N. Farrugia, M. Arzel and M. Jezequel, "Efficient Hardware Implementation of Incremental Learning and Inference on Chip," in *17th IEEE International New Circuits and Systems Conference (NEWCAS)*, pp. 1–4, 2019.
20. Q. Jodelet, V. Gripon and M. Hagiwara, "Transfer Learning with Sparse Associative Memories," in *International Conference on Artificial Neural Networks*, pp. 497–512, 2019.
21. G. B. Hacene, F. Leduc-Primeau, A. B. Soussia, V. Gripon and F. Gagnon, "Robustesse des réseaux de neurones profonds aux défaillances mémoire," in *GRETSI*, August 2019.
22. M. Bontonou, C. Lassance, J. Vialatte and V. Gripon, "Un modèle unifié pour la classification de signaux sur graphe avec de l'apprentissage profond," in *GRETSI*, August 2019.
23. C. Lassance, V. Gripon, J. Tang and A. Ortega, "Robustesse structurelle des architectures d'apprentissage profond," in *GRETSI*, August 2019.
24. M. Bontonou, C. Lassance, V. Gripon and N. Farrugia, "Comparing linear structure-based and data-driven latent spatial representations for sequence prediction," in *Wavelets and Sparsity XVIII*, San Diego, USA, August 2019.
25. C. Lassance, V. Gripon, J. Tang and A. Ortega, "Structural Robustness for Deep Learning Architectures," in *Data Science Workshop*, pp. 125–129, June 2019.
26. M. Bontonou, C. Lassance, G. B. Hacene, V. Gripon, J. Tang and A. Ortega, "Introducing Graph Smoothness Loss for Training Deep Learning Architectures," in *Data Science Workshop*, pp. 160–164, June 2019.
27. G. B. Hacene, F. Leduc-Primeau, A. B. Soussia, V. Gripon and F. Gagnon, "Training modern deep neural networks for memory-fault robustness," in *Proceedings of the IEEE International Symposium on Circuits and Systems*, pp. 1–5, May 2019.
28. M. Bontonou, C. Lassance, J. Vialatte and V. Gripon, "A Unified Deep Learning Formalism For Processing Graph Signals," in *SDM Special Session on Graph Neural Networks*, May 2019.
29. N. Grelier, C. R. K. Lassance, E. Dupraz and V. Gripon, "Graph-Projected Signal Processing," in *IEEE GlobalSIP*, pp. 763–767, 2018.
30. C. E. R. K. Lassance, J. Vialatte and V. Gripon, "Matching Convolutional Neural Networks without Priors about Data," in *Proceedings of Data Science Workshop*, pp. 234–238, 2018.
31. V. Gripon, G. B. Hacene, M. Löwe and F. Vermet, "Improving Accuracy of Nonparametric Transfer Learning Via Vector Segmentation," in *proceedings of ICASSP*, pp. 2966-2970, April 2018.
32. V. Gripon, A. Ortega and B. Girault, "An Inside Look at Deep Neural Networks using Graph Signal Processing," in *Proceedings of ITA*, pp. 1–9, February 2018.

33. G. B. Hacene, V. Gripon, N. Farrugia, M. Arzel and M. Jezequel, “Budget Restricted Incremental Learning with Pre-Trained Convolutional Neural Networks and Binary Associative Memories,” in *Proceedings of SIPS*, pp. 1063–1073, 2017.
34. G. B. Hacene, V. Gripon, N. Farrugia, M. Arzel and M. Jezequel, “Incremental Learning on Chip,” in *Proceedings of GlobalSip*, pp. 789–792, 2017.
35. M. Ménoret, N. Farrugia, B. Padeloup and V. Gripon, “Evaluating Graph Signal Processing for Neuroimaging Through Classification and Dimensionality Reduction,” in *Proceedings of GlobalSip*, pp. 618–622, 2017.
36. J. Vialatte, V. Gripon and G. Coppin, “Learning Local Receptive Fields and their Weight Sharing Scheme on Graphs,” in *Proceedings of GlobalSip*, pp. 623–627, 2017.
37. V. Gripon, “Tropical Graph Signal Processing,” in *Proceedings of the Asilomar conference*, pp. 50–54, October 2017.
38. E. Coyac, V. Gripon, C. Langlais and C. Berrou, “Robust Associative Memories Naturally Occuring From Recurrent Hebbian Networks Under Noise,” in *Arxiv Preprint*, September 2017.
39. E. Coyac, V. Gripon, C. Langlais and C. Berrou, “Performance of Neural Clique Networks Subject to Synaptic Noise,” in *Proceedings of Cognitive*, pp. 4–9, February 2017.
40. G. B. Hacene, V. Gripon, N. Farrugia, M. Arzel and M. Jezequel, “Finding All Matches in a Database using Binary Neural Networks,” in *Proceedings of Cognitive*, pp. 59–64, February 2017.
41. T. Stérin, N. Farrugia and V. Gripon, “An Intrinsic Difference Between Vanilla RNNs and GRU Models,” in *Proceedings of Cognitive*, pp. 76–81, February 2017.
42. N. Grelier, B. Padeloup, J. Vialatte and V. Gripon, “Neighborhood-Preserving Translations on Graphs,” in *Proceedings of GlobalSIP*, pp. 410–414, October 2016.
43. E. Coyac, V. Gripon, C. Langlais and C. Berrou, “Distributed Coding and Synaptic Pruning,” in *Proceedings of the 9th International Symposium on Turbo Codes and Iterative Information Processing*, pp. 206–210, September 2016.
44. A. Aboudib, V. Gripon and G. Coppin, “A Turbo-Inspired Iterative Approach for Correspondence Problems of Image Features,” in *Proceedings of the 9th International Symposium on Turbo Codes and Iterative Information Processing*, pp. 226–230, September 2016.
45. P. Tigréat, C. R. K. Lassance, X. Jiang, V. Gripon and C. Berrou, “Assembly Output Codes for Learning Neural Networks,” in *Proceedings of the 9th International Symposium on Turbo Codes and Iterative Information Processing*, pp. 285–289, September 2016.
46. D. Ferro, V. Gripon and X. Jiang, “Nearest Neighbour Search Using Binary Neural Networks,” in *Proceedings of IJCNN*, pp. 5106–5112, July 2016.
47. A. Mheich, M. Hassan, F. Wendling, M. Khalil, O. Dufor, V. Gripon and C. Berrou, “SimNet: A new algorithm for measuring brain networks similarity,” in *Proceedings of the ICABME international conference*, pp. 119–122, 2015.
48. B. Padeloup, V. Gripon, G. Mercier and D. Pastor, “Vers une caractérisation de la courbe d’incertitude pour des graphes portant des signaux,” in *Proceedings of the GRETSI conference*, 2015.
49. R. Danilo, V. Gripon, P. Coussy and L. Conde-Canencia, “Réseaux de Clusters de Neurones Restreints,” in *Proceedings of the GRETSI conference*, 2015.

50. E. Coyac, V. Gripon and C. Langlais, "Impact du bruit synaptique sur les performances des réseaux de cliques neurales," in *Proceedings of the GRETSI conference*, 2015.
51. B. Padeloup, M. Rabbat, V. Gripon, D. Pastor and G. Mercier, "Graph Reconstruction from the Observation of Diffused Signals," in *Proceedings of the 53rd Allerton Conference*, pp. 1386–1390, October 2015.
52. B. P. R. A. V. Gripon and M. Rabbat, "Toward an uncertainty principle for weighted graphs," in *Proceedings of the 23rd European Signal Processing Conference*, pp. 1496–1500, July 2015.
53. R. Danilo, H. Jarollahi, V. Gripon, P. Coussy, L. Conde-Canencia and W. J. Gross, "Algorithm and Implementation of an Associative Memory for Oriented Edge Detection Using Improved Clustered Neural Networks," in *Proceedings of ISCAS Conference*, pp. 2501–2504, May 2015.
54. R. Danilo, V. Gripon, P. Coussy, L. Conde-Canencia and W. J. Gross, "Restricted Clustered Neural Network for Storing Real Data," in *proceedings of GLSVLSI conference*, pp. 205–210, May 2015.
55. A. Mheich, M. Hassan, V. Gripon, O. Dufor, M. Khalil, C. Berrou and F. Wendling, "A novel algorithm for measuring graph similarity: application to brain networks," in *Proceedings of the IEEE EMBS Neural Engineering Conference*, pp. 1068–1071, April 2015.
56. A. Aboudib, V. Gripon and G. Coppin, "A Model of Bottom-Up Visual Attention Using Cortical Magnification," in *Proceedings of ICASSP*, pp. 1493–1497, April 2015.
57. E. S. Gooya, D. Pastor and V. Gripon, "Automatic face recognition using SIFT and networks of tagged neural cliques," in *Proceedings of Cognitive*, pp. 57–61, March 2015.
58. S. Larroque, E. S. Gooya, V. Gripon and D. Pastor, "Using Tags to Improve Diversity of Sparse Associative Memories," in *Proceedings of Cognitive*, pp. 1–7, March 2015.
59. C. Yu, V. Gripon, X. Jiang and H. Jégou, "Neural Associative Memories as Accelerators for Binary Vector Search," in *Proceedings of Cognitive*, pp. 85–89, March 2015.
60. A. Aboudib, V. Gripon and B. Tessiau, "Implementing Relational-Algebraic Operators for Improving Cognitive Abilities in Networks of Neural Cliques," in *Proceedings of Cognitive*, pp. 36–41, March 2015.
61. H. Jarollahi, N. Onizawa, V. Gripon, T. Hanyu and W. J. Gross, "Algorithm and Architecture for a Multiple-Field Context-Driven Search Engine Using Fully-Parallel Clustered Associative Memories," in *Proceedings of SiPS*, pp. 1–6, October 2014.
62. V. Gripon, V. Skachek and M. Rabbat, "Sparse Binary Matrices as Efficient Associative Memories," in *Proceedings of the 52nd Allerton conference*, pp. 499–504, October 2014.
63. C. Berrou, O. Dufor, V. Gripon and X. Jiang, "Information, Noise, Coding, Modulation: What about the Brain?," in *Proceedings of the 8th symposium on Turbo Codes and Iterative Information Processing*, pp. 167–172, August 2014.
64. B. Boguslawski, V. Gripon, F. Seguin and F. Heitzmann, "Huffman Coding for Storing Non-uniformly Distributed Messages in Networks of Neural Cliques," in *proceedings of the Twenty-Eighth AAI Conference on Artificial Intelligence, volume 1*, pp. 262–268, July 2014.
65. Z. Yao, V. Gripon and M. Rabbat, "A GPU-based Associative Memory using Sparse Neural Networks," in *Proceedings of the PCNN-14 conference*, pp. 688–692, July 2014.
66. F. Leduc-Primeau, V. Gripon, M. Rabbat and W. Gross, "Cluster-based Associative Memories Built From Unreliable Storage," in *ICASSP*, pp. 8370–8374, May 2014.

67. M. Rabbat and V. Gripon, "Towards a Spectral Characterization of Signals Supported on Small-World Networks," in *ICASSP*, pp. 4793–4797, May 2014.
68. A. Aboudib, V. Gripon and X. Jiang, "A study of retrieval algorithms of sparse messages in networks of neural cliques," in *Proceedings of Cognitive 2014*, pp. 140–146, May 2014.
69. V. Gripon, V. Skachek and M. G. Rabbat, "Sparse Structured Associative Memories as Efficient Set-Membership Data Structures," in *Proceedings of the 51st Allerton conference*, pp. 500–505, October 2013.
70. V. Gripon and M. Rabbat, "Maximum Likelihood Associative Memories," in *Proceedings of Information Theory Workshop*, pp. 1–5, September 2013.
71. V. Gripon and X. Jiang, "Mémoires associatives pour observations floues," in *Proceedings of XXIV-th GretsI seminar*, September 2013.
72. V. Gripon and M. Rabbat, "Reconstructing a Graph from Path Traces," in *Proceedings of International Symposium on Information Theory*, pp. 2488–2492, July 2013.
73. H. Jarollahi, V. Gripon, N. Onizawa and W. J. Gross, "A Low-Power Content-Addressable-Memory Based on Clustered-Sparse-Networks," in *Proceedings of 24th International Conference on Application-specific Systems, Architectures and Processors*, pp. 642–653, June 2013.
74. H. Jarollahi, N. Onizawa, V. Gripon and W. J. Gross, "Reduced-complexity binary-weight-coded associative memories," in *Proceedings of International Conference on Acoustics, Speech, and Signal Processing*, pp. 2523–2527, May 2013.
75. V. Gripon, M. Rabbat, V. Skachek and W. J. Gross, "Compressing multisets using tries," in *Proceedings of Information Theory Workshop*, Lausanne, Switzerland, pp. 647–651, September 2012.
76. V. Gripon, V. Skachek, W. J. Gross and M. Rabbat, "Random clique codes," in *Proceedings of 7th International Symposium on Turbo Codes and Iterative Information Processing*, Gothenburg, Sweden, pp. 121–125, August 2012.
77. X. Jiang, V. Gripon and C. Berrou, "Learning long sequences in binary neural networks," in *Proceedings of Cognitive 2012*, Nice, France, pp. 165–170, July 2012.
78. H. Jarollahi, N. Onizawa, V. Gripon and W. J. Gross, "Architecture and Implementation of an Associative Memory Using Sparse Clustered Networks," in *Proceedings of IEEE International Symposium on Circuits and Systems*, pp. 2901–2904, May 2012.
79. V. Gripon and C. Berrou, "Nearly-optimal associative memories based on distributed constant weight codes," in *Proceedings of Information Theory and Applications Workshop*, San Diego, CA, USA, pp. 269–273, February 2012.
80. V. Gripon and C. Berrou, "A simple and efficient way to store many messages using neural cliques," in *Proceedings of IEEE Symposium on Computational Intelligence, Cognitive Algorithms, Mind, and Brain*, Paris, France, pp. 54–58, April 2011.
81. C. Berrou and V. Gripon, "Coded Hopfield networks," in *Proceedings of 6th International Symposium on Turbo Codes and Iterative Information Processing*, Brest, France, pp. 1–5, September 2010.
82. V. Gripon and O. Serre, "Qualitative Concurrent Stochastic Games with Imperfect Information," in *Proceedings of 36th International Colloquium of Automata, Languages and Programming*, Springer, Lecture Notes in Computer Science, Rhodes, Greece, pp. 200–211, July 2009.

Invited Talks, Seminars

1. Exposé, "Graphs for Deep Neural Networks Latent Representations", *Edge Seminar*, Nice, France, July 2020.
2. Invited talk, "A Review of Compression Methods for Deep Convolutional Neural Networks", *TinyML*, Montréal, July 2020.
3. Invited talk, "A Review of Compression Methods for Deep Convolutional Neural Networks", *TinyML*, Montréal, July 2020.
4. Invited talk, "Deep Learning with Few Resources", *Pracom Seminar*, Brest, June 2020.
5. Invited talk, "A Review of Compression Methods for Deep Convolutional Neural Networks", *International Workshop of Emerging Technologies for Brainware LSI and its Applications*, Honolulu, Hawaii, USA, December 2019.
6. Invited talk, "Using Graphs to Visualize, Train and Improve Deep Neural Networks", *SNT seminar*, Luxembourg, November 2019.
7. Invited talk, "Efficient Implementations of Deep Learning Architectures", *Seminar of University of Rochester*, Rochester, USA, September 2019.
8. Invited talk, "Artificial Intelligence: the goods and bads", *Dialogues: les éclaireurs*, Brest, France, August 2019.
9. Exposé, "A Unified Deep Learning Formalism for Processing Graph Signals", *Graph Signal Processing workshop*, Minneapolis, June 2019.
10. Exposé, "A Unified Deep Learning Formalism for Processing Graph Signals", *GSP 2019*, Minneapolis, Minnesota, June 2019.
11. Invited talk, "Robust Deep Learning Inference with Limited Resources", *CUG*, Montréal, May 2019.
12. Invited talk, "Robust Deep Learning Inference with Limited Resources", *CUG*, Montréal, May 2019.
13. Invited talk, "Matching Convolutional Neural Networks with Graph Signals", *STATOS workshop*, Roma, Italy, September 2018.
14. Invited talk, "Convolutional Neural Networks for Signals on Graphs", *Deep Learning Workshop*, Technicolor, Rennes, September 2018.
15. Exposé, "Graph Signal Processing for Machine Learning", *FASIC workshop*, Adelaide, Australia, July 2018.
16. Invited talk, "Neural Networks and Artificial Intelligence", *Beyond Gynecological Surgery*, Clermont Ferrand, April 2018.
17. Exposé, "Convolutional Neural Networks on Irregular Domains", *Learning Theory reading group*, MILA, Montréal, April 2018.
18. Exposé, "Dangers of AI", *Semaine du cerveau*, March 2018.
19. Exposé, "Informational Neuroscience and Artificial Intelligence", ENIB, January 2018.
20. Exposé, "Extending Convolutional Neural Networks to Irregular Domains", University of South California, November 2017.
21. Invited talk, "L'IA et le HPC", *Round table at Collège de France to celebrate the 10 years of GENCI*, Collège de France, October 2017.

22. Exposé, "Generalizing Convolutional Neural Networks to Irregular Domains", *Visit at McGill*, McGill University, Montréal, July 2017.
23. Exposé, "Supervised Classification of Brain Imaging using Graph Signal Processing", *GSP-17*, Pittsburgh, PA, June 2017.
24. Exposé, "Tropical Graph Signal Processing", *GSP-17*, Pittsburgh, PA, June 2017.
25. Exposé, "S'inspirer du cerveau pour l'Intelligence Artificielle", *Brain's week*, Brest, March 2017.
26. Invited talk, "An attempt at characterizing graph translations in the vertex domain", *Barbados McGill gathering on Graph Signal Processing*, Barbados, February 2017.
27. Seminar, "Intelligence artificielle et neurosciences informationnelles", ENS-Lyon, January 2017.
28. Seminar, "Intelligence artificielle et neurosciences informationnelles", Kérichen high school, November 2016.
29. Seminar, "Vers une théorie de l'information mentale", *Century of the birth of Claude Shannon*, Institut Henri Poincaré, Paris, October 2016.
30. Invited talk, "Neurosciences informationnelles et intelligence artificielle", *Journée Intelligence Artificielle : le renouveau*, French Academy of Science, October 2016.
31. Seminar, "Réseaux de neurones binaires et applications", *Séminaire Institut Brestois du Numérique et des Mathématiques*, Brest, September 2016.
32. Invited talk, "Coding for machine learning and neural networks", *International symposium on turbo codes and iterative information processing*, Brest, September 2016.
33. Invited talk, "Mémoire associative basse consommation avec jonctions tunnel magnétiques", *Journée conférence débat "Atteindre une efficacité énergétique extrême dans les systèmes de calcul avec la bio-inspiration"*, Orsay, April 2016.
34. Invited talk, "Binary neural networks and applications", *ENS Lyon ski seminar*, les sept laux, January 2016.
35. Exposé, "Binary associative memories and applications", Brown University, December 2015.
36. Exposé, "Binary associative memories and applications", McGill University, November 2015.
37. Exposé, "Error correcting graphs for explaining long term memory", Nice, March 2015.
38. Invited talk, "Is information encoding in the brain analogic or digital?", *Panel Cognitive 2015*, Nice, March 2015.
39. Seminar, "Informational neurosciences: error correcting codes in the brain", *Recent advances in computationnal neurosciences seminar*, ENS Lyon, January 2015.
40. Exposé, ""Computing with associative memories"", *Ski-week of ENS Lyon*, Les sept Laux, January 2015.
41. Exposé, "Exploiting high dimensionality for similarity search", *NIPS 2014 workshop*, Montréal, December 2014.
42. Exposé, "Error correcting codes and long term memory", EPFL, November 2014.
43. Invited talk, "Associative memories for computing", *Hipeac HPC Workshop*, Athens, Greece, October 2014.
44. Exposé, "Neurosciences informationnelles", *GRETSI summer school*, Peyresq, June 2014.

45. Associated with an invited talk, "'L'information mentale'", *UPMC Colloquium*, University Pierre et Marie Curie, March 2014.
46. Seminar, "Reconstructing a graph from path traces", *DECIDE team seminar*, Télécom Bretagne, February 2014.
47. Seminar, "Signal processing on graphs", *Télécom Bretagne lunch seminar*, February 2014.
48. Invited talk, "Resilient and energy efficient memories based on neuro-inspired codes", *2nd RIEC Symposium on Brain Functions and Brain Computer*, Sendai, Japan, February 2014.
49. Invited talk, "Un modèle numérique de la mémoire à long terme : l'information mentale", *Cantine numérique*, Quimper, November 2013.
50. Associated with an invited talk, "Codes sur graphes et mémoire cérébrale", *XXIV colloque Grets*, Brest, September 2013.
51. Invited talk, "L'information mentale", *Sicma doctoral school day*, Télécom Bretagne, September 2013.
52. Seminar, "Calculating using associative memories", *Thursday Seminar*, Tartu University, Estonia, June 2013.
53. Seminar, "Calculating using associative memories", *68nqrt Seminar*, IRISA, Rennes, June 2013.
54. Invited talk, "L'information mentale", *Tuesdays at Espace des sciences*, Rennes, May 2013.
55. Seminar, "When neural networks meet error correcting codes: towards new architectures for associative memories", *NeuroMathComp seminar*, INRIA Sophia Antipolis, Nice, April 2013.
56. Associated with an invited talk, "When neural networks meet error-correction coding: new perspectives in associative memories", *International Workshop on Neuromorphic and Brain-Based Computing Systems*, Grenoble, France, March 2013.
57. Seminar, "Les mémoires associatives : point de rencontre naturel entre calcul et mémoires", *ENS-Cachan, Dept. Computer Science and Telecommunications*, Rennes, March 2013.
58. Invited talk, "When neural networks meet error correcting codes: new perspectives for resilient associative memories", *Neuro Inspired Accelerators for Computing workshop, HiPEAC conference*, Berlin, Germany, January 2013.
59. Seminar, "Neural coding: from error correcting codes to associative memories", *ICI seminar*, ETIS, ENSEA, November 2012.
60. Seminar, "When neural networks meet error correcting codes: towards resilient associative memories", CEA-LETI, Grenoble, November 2012.
61. Seminar, "How to improve associative memories using neural coding?", *Neucod seminar*, Télécom Bretagne, Brest, September 2012.
62. Associated with an invited talk, "Looking at the neocortex as a distributed decoder", *7th International Symposium on Turbo Codes*, Gothenburg, Sweden, August 2012.
63. Invited talk, "Neural coding: a perspective for new associative memories", *Japan-France Frontiers of Engineering program*, Kyoto, Japan, February 2012.
64. Invited talk, "Nearly-optimal associative memories based on distributed constant weight codes", *Information Theory and Applications workshop*, San Diego, CA, February 2012.
65. Exposé, "Networks of Neural Cliques", Université de Montréal, November 2011.

66. Associated with an invited talk, "Graphs, codes and the brain", *14th International Symposium on Wireless Personal Multimedia Communications*, October 2011.
67. Seminar, "Neural computation: min, sum and max", *UBO mathematical department seminar*, University of Western Brittany, May 2011.
68. Exposé, Télécom Bretagne, March 2011.
69. Exposé, "Networks of Neural Cliques", McGill University, February 2011.
70. Exposé, "Réseaux de neurones parcimonieux à grande diversité d'apprentissage", École Supérieure de Physique et Chimie Industrielles, December 2010.
71. Seminar, "Networks of Neural Cliques: Some (not so) open issues", Télécom Bretagne, September 2010.
72. Seminar, *Breizh seminar of mathematics PhD students*, Western Brittany University, December 2009.
73. Seminar, *4th year students seminar*, École Normale Supérieure of Rennes, January 2009.

Patents

- "Dispositif d'apprentissage et de décodage de messages, mettant en oeuvre un réseau de neurones, procédés d'apprentissage et de décodage et programmes d'ordinateur correspondants", number 1056760.

Fundings obtained

- **LabEx CominLabs**—2 years project, Oct. 2015, 291k€.
- **Lab-STICC funding**—Furnitures, Sept. 2012, 6k€.
- **Private funding**—6 month project, 2018, 30k€.
- **Private funding**—18 month project, 2018-2019, 150k€.
- **Private funding**—18 month project, 2019-2020, 150k€.
- **IMT Atlantique MOOC funding**—6 month project, 2018, 40k€.
- **Region Bretagne funding**—36 month project, 2018, 50k€.
- **CNRS GDR ISIS funding**—24 month project, 2019, 7k€.
- **Brest Metropole funding**—36 month project, 2017, 50k€.
- **PRACom funding**—36 month project, 2017, 50k€.
- **FASIC funding (joint with University of Adelaide, Australia)**—12 month project, 2018, 7k€.

- **Futur et Ruptures**—36 month project, 2015, 110k€.
- **ERE DGA**—One year project, 2018-2019, 20k€.
- **TSN Carnot**—One year project, 2020, 50k€.
- **Samuel de Champlain**—Two years project, 2020, 10k€.

Other

- **Co-creator and co-organizer of TaupIC**—French programming annual contest for top undergraduate students
6h long online contest, from 2011 to 2015
 - More than 140 teams have participated.
- **Participant in IEEE Xtreme programming competition**—World wide online programming competition in teams of three
5th session, 2011
 - We finished 5th out of 1515 teams.
- **Organization of summer school on “mental information”**—LIESSE
Télécom Bretagne, 2013
- **Organization of the ENS webchat for contest competitors**—Institut Henri Poincaré
2014
- **Invited Lecturer for the Artificial Intelligence seminar at Académie des Sciences**—Paris
2016
- **Co-creator of the edX MOOC “Advanced Algorithmic and Graph Theory with Python” (9000+ students so far).**—IMT
2018