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charpent@in.tum.de

# Bertrand Charpentier

## Web

**DAML Lab - Team**  
Bertrand Charpentier  
**Scholar**  
Bertrand Charpentier  
**Git**  
sharpenb  
**Twitter**  
Bertrand\_Charp  
**Mastodon**  
@Bertrand\_Charp  
**LinkedIn**  
bertrand-charpentier  
**Medium**  
bertrand-charpentier

## Programming

Python • PyTorch •  
TensorFlow • C/C++ •  
SQL • R • Matlab •  
Java • Bash • Ada

## Software

Linux • Windows •  
Office softwares •  
L<sup>A</sup>T<sub>E</sub>X • IDE • Git

## Languages

French - Native  
English - C1  
German - B2  
Swedish - B2

## Education

- 2018-21 **Ph.D. in Machine Learning** [TUM - Technical University of Munich - Munich](#)  
Preparation of a Ph.D. under supervision of Prof. Dr. Günnemann
- 2016-18 **M.Sc. in Machine Learning** [KTH - Swedish Royal Institute of Technology - Stockholm](#)  
Received a M.Sc. in Machine Learning, Mathematics and Statistics with **first class honours**  
*Machine Learning (Advanced) • Probability Theory • Artificial Neural Network • Martingales and Stochastic Integrals • Deep Learning • Neuroscience • Time Series Analysis*
- 2014-18 **M.Sc. & B.Sc. in Mathematics and Computer Science** [Ensimag - Grenoble](#)  
Received a B.Sc. and a M.Sc. specialized in Mathematical Modeling, Image and Simulation with **first class honours**  
*Algorithms (Advanced) • Analysis • Optimization • Partial Differential Equation (Advanced) • Data mining • Probability for Learning • Information Theory • Operations Research (Advanced) • Language Theory • DataBase • Concurrent Programming • Computer Architecture Elements*
- 2012-14 **Classes Préparatoires aux Grandes Ecoles - CPGE** [Lycée Henri IV - Paris](#)  
Received **Intensive training** in Mathematics and Physics to prepare the National French "Grandes Ecoles" competitive exam. Selected to join Ensimag
- 2009-12 **Baccalauréat in Scientific section** [Lycée Buffon - Paris](#)  
Received the Baccalauréat degree with major in Maths and Physics with **first class honours** after the French High School

## Experiences

- 2023 **Chief Scientist Officer** [Pruna AI - Munich](#)  
Making any AI model to significantly cheaper, faster, smaller, greener in one line of code  
• Tested on 100+ AI models covering prediction and generation for computer vision, natural language processing, molecules, and more.  
• Combined SOTA compression methods to achieve x2-10 efficiency gains.
- 2022-23 **Research Intern** [Twitter - Cortex Team - Munich](#)  
Collaboration with all members of the Cortex team including Emanuelle Rossi, Francesco di Giovanni, Michael Bronstein  
• Research interests: *Scalable ML • ML for Graphs • Physic-inspired ML*
- 2021-22 **Research Visit** [Stanford University - Stanford Intelligent Systems Laboratory - Stanford](#)  
Collaboration with Dr. Senanayake and Prof. Dr. Kochenderfer  
• Research interests: *Uncertainty Estimation • Reinforcement Learning*
- 2018-23 **Ph.D. Student** [TUM - Data Analytics and Machine Learning Group - Munich](#)  
• Research interests: *Uncertainty Estimation • Robustness • Causal Inference • ML for Graphs*  
• Teaching: *ML Lecture • ML for Graphs and Sequential Data Lecture • ML Practical Course • ML Research Seminar • Supervision of 20 Master's Thesis and Guided Research*  
• Reviewing: *Neurips • ICML*  
• External collaboration: *BMW • Siemens • Multiscale Modeling of Fluid Materials Group (TUM)*  
• Others: *Participation at Mediterranean ML School 2020 • Obtaining MDSI grant*
- 2017-18 **Research Intern & Research Assistant** [Télécom ParisTech - LINCS - Paris](#)  
• Research interests: *ML for Graphs • Multi-scale and Hierarchical Clustering*  
• Package: *Creation of scikit-network for graph analysis in Python*  
• External collaboration: *Deezer*
- 2015-16 **Spring Intern & Summer Analyst** [Morgan Stanley - London](#)  
Equity derivatives, vanilla and structured products analysis • Performance of a trading software caption

## Publications

- 2023 **Edge Directionality Improves Learning on Heterophilic Graphs** [MLG - ECML PKDD](#)  
E. Rossi, B. Charpentier, F. di Giovanni, F. Frasca, S. Günnemann, M. Bronstein
- 2023 **Uncertainty Estimation for Molecules: Desiderata and Methods** [ICML](#)  
T. Wollschlager, N. Gao, B. Charpentier, M. A. Ketata, S. Günnemann
- 2023 **Accuracy is not the only Metric that matters: Estimating the Energy Consumption of Deep Learning Models** [ICML - TCCML workshop \(Spotlight\)](#)  
J. Getzner, B. Charpentier, S. Günnemann
- 2023 **Training, Architecture, and Prior for Deterministic Uncertainty Methods** [ICLR - TrustML workshop](#)  
B. Charpentier, C. Zhang, S. Günnemann
- 2022 **Disentangling Epistemic and Aleatoric Uncertainty in Reinforcement Learning** [ICML - DFUQ workshop](#)  
B. Charpentier, R. Senanayake, M. Kochenderfer, S. Günnemann
- 2022 **Winning the Lottery Ahead of Time: Efficient Early Network Pruning** [ICML \(Spotlight\)](#)  
J. Rachwan, D. Zügner, B. Charpentier, S. Geisler, M. Ayle, S. Günnemann
- 2022 **On the Robustness and Anomaly Detection of Sparse Neural Networks** [SNN workshop](#)  
M. Ayle, B. Charpentier, J. Rachwan, D. Zügner, S. Geisler, S. Günnemann
- 2022 **Natural Posterior Network: Deep Bayesian Uncertainty for Exponential Family Distributions** [ICLR \(Spotlight\)](#)  
B. Charpentier\*, O. Borchert\*, D. Zügner, S. Geisler, S. Günnemann
- 2022 **Differentiable DAG Sampling** [ICLR](#)  
B. Charpentier, S. Kibler, S. Günnemann
- 2022 **En-to-End Learning of Probabilistic Hierarchies on Graphs** [ICLR](#)  
D. Zügner, B. Charpentier, M. Ayle, S. Geringer, S. Günnemann
- 2021 **Graph Posterior Network: Bayesian Predictive Uncertainty for Node Classification** [NeurIPS](#)  
M. Stadler\*, B. Charpentier\*, S. Geisler, D. Zügner, S. Günnemann
- 2021 **Evaluating Robustness of Predictive Uncertainty Estimation: Are Dirichlet-based Models Reliable?** [ICML](#)  
A. Kopetzki\*, B. Charpentier\*, D. Zügner, S. Günnemann
- 2021 **On OOD Detection with Energy-Based Models** [UDL - ICML workshop](#)  
S. Elflein, B. Charpentier, D. Zügner, S. Günnemann
- 2020 **Posterior Network: Uncertainty Estimation without OOD Samples via Density-Based Pseudo-Counts** [NeurIPS](#)  
B. Charpentier, D. Zügner, S. Günnemann
- 2020 **Scikit-network: Graph Analysis in Python** [JMLR](#)  
T. Bonald, N. de Lara, Q. Lutz, B. Charpentier
- 2019 **Uncertainty on Asynchronous Time Event Prediction** [NeurIPS \(Spotlight\)](#)  
M. Bilos\*, B. Charpentier\*, S. Günnemann
- 2019 **Tree Sampling Divergence: An Information-Theoretic Metric for Hierarchical Graph Clustering** [IJCAI](#)  
B. Charpentier, T. Bonald
- 2018 **Hierarchical Graph Clustering by Node Pair Sampling** [MLG - KDD workshop](#)  
T. Bonald, B. Charpentier, A. Galland, A. Hollocou
- 2018 **Multi-scale Clustering in Graphs using Modularity** [DiVA - KTH](#)  
B. Charpentier