Mathieu Pont

Post-doctoral Researcher

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🆔 0000-0002-0037-0314   🐙 https://github.com/MatPont   🌐 `https://mathieu-pont.github.io`

Work Experience

2024 – Ongoing	**Post-doctoral Position** *Kaiserslautern-Landau University (Scientific Visualization Lab).*
2023 – 2024 (10 months)	**Post-doctoral Position** *CNRS and Sorbonne Université (LIP6).*
2020 (6 months)	**Master 2 Research Intern** *CNRS and Sorbonne Université (LIP6).* Title: *Topologically Discriminant Metric.* Advisor: *Julien Tierny.*
2019 (3 months)	**Master 1 Research Intern** *Paris Descartes University (LIPADE).* Title: *Biomedical Corpus Analysis.* Advisor: *Séverine Affeldt.*
2018 (3 months)	**Bachelor Research Intern** *Toulouse Paul Sabatier University (IRIT).* Title: *Comparison of Deep Reinforcement Learning methods with an existing Multi-Agent System.* Advisors: *Frédéric Migeon and Jêrome Mengin.*
2016 (3 months)	**DUT Research Intern** *ISAE-Supaero.* Title: *Server Room Thermal Monitoring and Evaluation of EV3 Robotic Kit.* Advisors: *Régine Leconte and Jean-François Dassieu.*

Education

2020 – 2023	**Ph.D. in Computer Science** *CNRS and Sorbonne Université (LIP6).* Title: *Analysis of Ensembles of Topological Descriptors.* Advisor: *Julien Tierny.*
2018 – 2020	**Master's Degree in Computer Science** *"Machine Learning for Data Science" track of Paris Descartes University.* Rank: *1 / 38 (S4) ; 1 / 37 (S3) ; 1 / 33 (S2) and 3 / 33 (S1)*
2016 – 2018	**Bachelor's Degree in Computer Science** *Toulouse Paul Sabatier University.* Rank: *4 / 152*
2014 – 2016	**DUT GEII (Electrical and Computer Science Engineering)** *Toulouse Paul Sabatier University.*

Awards

2023
- **Best Paper Honorable Mention** at IEEE VIS 2023
  For the paper: "Merge Tree Geodesics and Barycenters with Path Mappings"

- **Best Paper and Presentation Award** at CORESA 2023
  For the talk: "Analyse en Géodésiques Principales d'Arbres de Fusion (et de Diagrammes de Persistance)"

Research

Thesis

2023
- **Analysis of Ensembles of Topological Descriptors**
  <u>Mathieu Pont</u>
  Ph.D. thesis in Computer Science
  Committee: *Gabriel Peyré (President), David Coeurjolly (Reviewer), Vijay Natarajan (Reviewer), Elsa Cazelles (Examiner), Stanley Durrleman (Examiner), Roland Kwitt (Examiner), Katharine Turner (Examiner), Julien Tierny (Advisor)*

Publications

2024
- **A Practical Solver for Scalar Data Topological Simplification**
  Mohamed Kissi, <u>Mathieu Pont</u>, Joshua A. Levine, Julien Tierny
  IEEE Transactions on Visualization and Computer Graphics
  Proc. of IEEE VIS 2024

2023
- **Wasserstein Auto-Encoders of Merge Trees (and Persistence Diagrams)**
  <u>Mathieu Pont</u> and Julien Tierny
  IEEE Transactions on Visualization and Computer Graphics
  Presented at IEEE VIS 2024

- **Merge Tree Geodesics and Barycenters with Path Mappings**
  Florian Wetzels, <u>Mathieu Pont</u>, Julien Tierny and Christoph Garth
  IEEE Transactions on Visualization and Computer Graphics
  Proc. of IEEE VIS 2023
  Best Paper Honorable Mention

2022
- **Principal Geodesic Analysis of Merge Trees (and Persistence Diagrams)**
  <u>Mathieu Pont</u>, Jules Vidal and Julien Tierny
  IEEE Transactions on Visualization and Computer Graphics
  Presented at IEEE VIS 2023

2021
- **Wasserstein Distances, Geodesics and Barycenters of Merge Trees**
  <u>Mathieu Pont</u>, Jules Vidal, Julie Delon and Julien Tierny
  IEEE Transactions on Visualization and Computer Graphics
  Proc. of IEEE VIS 2021

Technical Reports

2023 • **A Hands-on TTK Tutorial for Absolute Beginners**
Christoph Garth, Robin Maack, <u>Mathieu Pont</u>, Julien Tierny, Bei Wang, Florian Wetzels, Michael Will
IEEE VIS Tutorials 2023

2022 • **Topological Analysis of Ensemble Scalar Data with TTK, A Sequel**
Christoph Garth, Charles Gueunet, Pierre Guillou, Federico Iuricich, Joshua Levine, Jonas Lukasczyk, <u>Mathieu Pont</u>, Julien Tierny, Jules Vidal, Bei Wang, Florian Wetzels
IEEE VIS Tutorials 2022

Professional Service

Reviewer • **La Matematica**
2024

• **IEEE Transactions on Pattern Analysis and Machine Intelligence (TPAMI)**
2023

Talks

2024 • **Poster: Wasserstein Auto-Encoders of Merge Trees (and Persistence Diagrams)**
Nov. 21st, CORESA

• **Wasserstein Auto-Encoders of Merge Trees (and Persistence Diagrams)**
Oct. 17th, IEEE VIS

• **Variability Analysis of Ensembles of Topological Descriptors**
Jul. 1st, Kaiserslautern-Landau Invited Talk

• **Auto-Encodeurs de Wasserstein d'Arbres de Fusion (et de Diagrammes de Persistance)**
Jun. 18th, Journée Visu

• **Auto-Encodeurs de Wasserstein d'Arbres de Fusion (et de Diagrammes de Persistance)**
May 30th, Journée APR

2023

- **Analysis of Ensembles of Topological Descriptors**
  Dec. 1st, Ph.D. Defense

- **Principal Geodesic Analysis of Merge Trees (and Persistence Diagrams)**
  Oct. 26th, IEEE VIS

- **Tutorial: Wasserstein Distances between Persistence Diagrams in TTK**
  Oct. 22nd, IEEE VIS

- **Principal Geodesic Analysis of Merge Trees (and Persistence Diagrams)**
  Oct. 16th, Pre-VIS Day

- **Analyse en Géodésiques Principales d'Arbres de Fusion (et de Diagrammes de Persistance)**
  Jun. 23rd, Journée APR

- **Analyse en Géodésiques Principales d'Arbres de Fusion (et de Diagrammes de Persistance)**
  Jun. 22nd, Journée Visu

- **Analyse en Géodésiques Principales d'Arbres de Fusion (et de Diagrammes de Persistance)**
  Jun. 8th, CORESA – Best Paper and Presentation Award!

2022

- **Distances de Wasserstein, Géodésiques et Barycentres d'Arbres de Fusion**
  Nov. 25th, JFIG

- **Tutorial: Wasserstein Distances, Barycenters and Clusters of Merge Trees in TTK**
  Oct. 17th, IEEE VIS, Recorded Talk

- **Distances de Wasserstein, Géodésiques et Barycentres d'Arbres de Fusion**
  Jun. 28th, Journée Visu

2021

- **Wasserstein Distances, Geodesics and Barycenters of Merge Trees**
  Oct. 28th, IEEE VIS, Recorded Talk

Teaching Experience

2022 − 2023

- **Introduction to Programming 1**
  $\sim 40h$ *in Bachelor 1 using Python*

- **Data Structures**
  $\sim 20h$ *in Bachelor 2 using C*

2021 − 2022

- **Introduction to Programming 1**
  $\sim 40h$ *in Bachelor 1 using Python*

- **Introduction to Scientific Visualization**
  $\sim 20h$ *in Master 2 using C++ and ParaView*

2020 − 2021

- **Introduction to Scientific Visualization**
  $\sim 20h$ *in Master 2 using C++ and ParaView*

- **Introduction to Programming 2**
  $\sim 40h$ *in Bachelor 1 using C*