Mathieu Pont

Post-doctoral Researcher

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https://github.com/MatPont
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Work Experience

2023 – Ongoing
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**
  Mathieu Pont
  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

2023

- **Wasserstein Auto-Encoders of Merge Trees (and Persistence Diagrams)**
  Mathieu Pont and Julien Tierny
  IEEE Transactions on Visualization and Computer Graphics
  To be presented at IEEE VIS 2024
- **Merge Tree Geodesics and Barycenters with Path Mappings**
  Florian Wetzels, Mathieu Pont, 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)**
  Mathieu Pont, 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**
  Mathieu Pont, 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, Mathieu Pont, 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, Mathieu Pont, 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

- **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*