

Mathieu Pont

Post-doctoral Researcher

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Work Experience

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

Education

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

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

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| 2023 | <ul style="list-style-type: none">• A Hands-on TTK Tutorial for Absolute Beginners
Christoph Garth, Robin Maack, <u>Mathieu Pont</u>, Julien Tierny, Bei Wang, Florian Wetzels, Michael Will
<i>IEEE VIS Tutorials 2023</i> |
| 2022 | <ul style="list-style-type: none">• 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
<i>IEEE VIS Tutorials 2022</i> |

Professional Service

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| Reviewer | <ul style="list-style-type: none">• La Matematica
2024• IEEE Transactions on Pattern Analysis and Machine Intelligence (TPAMI)
2023 |
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Talks

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| 2024 | <ul style="list-style-type: none">• Variability Analysis of Ensembles of Topological Descriptors
<i>Jul. 1st, Kaiserslautern-Landau Invited Talk</i>• Auto-Encodeurs de Wasserstein d'Arbres de Fusion (et de Diagrammes de Persistance)
<i>Jun. 18th, Journée Visu</i>• Auto-Encodeurs de Wasserstein d'Arbres de Fusion (et de Diagrammes de Persistance)
<i>May 30th, Journée APR</i> |
| 2023 | <ul style="list-style-type: none">• Analysis of Ensembles of Topological Descriptors
<i>Dec. 1st, Ph.D. Defense</i>• Principal Geodesic Analysis of Merge Trees (and Persistence Diagrams)
<i>Oct. 26th, IEEE VIS</i>• Tutorial: Wasserstein Distances between Persistence Diagrams in TTK
<i>Oct. 22nd, IEEE VIS</i>• Principal Geodesic Analysis of Merge Trees (and Persistence Diagrams)
<i>Oct. 16th, Pre-VIS Day</i>• Analyse en Géodésiques Principales d'Arbres de Fusion (et de Diagrammes de Persistance)
<i>Jun. 23rd, Journée APR</i>• Analyse en Géodésiques Principales d'Arbres de Fusion (et de Diagrammes de Persistance)
<i>Jun. 22nd, Journée Visu</i>• Analyse en Géodésiques Principales d'Arbres de Fusion (et de Diagrammes de Persistance)
<i>Jun. 8th, CORESA – Best Paper and Presentation Award!</i> |

2022	<ul style="list-style-type: none"> • Distances de Wasserstein, Géodésiques et Barycentres d'Arbres de Fusion <i>Nov. 25th, JFIG</i> • Tutorial: Wasserstein Distances, Barycenters and Clusters of Merge Trees in TTK <i>Oct. 17th, IEEE VIS, Recorded Talk</i> • Distances de Wasserstein, Géodésiques et Barycentres d'Arbres de Fusion <i>Jun. 28th, Journée Visu</i>
2021	<ul style="list-style-type: none"> • Wasserstein Distances, Geodesics and Barycenters of Merge Trees <i>Oct. 28th, IEEE VIS, Recorded Talk</i>

Teaching Experience

2022 – 2023	<ul style="list-style-type: none"> • Introduction to Programming 1 <i>~ 40h in Bachelor 1 using Python</i> • Data Structures <i>~ 20h in Bachelor 2 using C</i>
2021 – 2022	<ul style="list-style-type: none"> • Introduction to Programming 1 <i>~ 40h in Bachelor 1 using Python</i> • Introduction to Scientific Visualization <i>~ 20h in Master 2 using C++ and ParaView</i>
2020 – 2021	<ul style="list-style-type: none"> • Introduction to Scientific Visualization <i>~ 20h in Master 2 using C++ and ParaView</i> • Introduction to Programming 2 <i>~ 40h in Bachelor 1 using C</i>