Mattéo Couplet

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Research

Postdoctoral Associate – BAEF Fellow — Boston University
Advised by Prof. Edward Chien — *2024 – present*

- Geometry processing for computational fabrication (machine knitting, additive manufacturing).

PhD Researcher – FNRS Fellow — UCLouvain (Belgium)
Advised by Prof. Jean-François Remacle — *2020 – 2024*

- Mathematical methods for structured mesh generation (quad and hex meshing).

Research Intern – Lhoist Berghmans Scholar — Massachusetts Institute of Technology
Advised by Prof. Laurent Demanet — *Summer 2019*

- Deep learning-driven porous media reconstruction.

Education

PhD in Applied Mathematics — UCLouvain (Belgium), *2024*

- **Dissertation:** *Integrable frame fields for quadrilateral and hexahedral meshing.*
  Advised by Prof. Jean-François Remacle.

MSc in Applied Mathematics, *summa cum laude* — *2020*

- **Master Thesis:** *Porous media reconstruction using deep texture synthesis.*
  Advised by Profs. Laurent Demanet (MIT) and Laurent Jacques.
- **Relevant coursework:** Optimization models and methods, Advanced numerical methods (for fluid dynamics), Computational geometry, Machine Learning.

BSc in Engineering, *summa cum laude* — *2018*

Publications

Rahul Mitra, Mattéo Couplet, Tongtong Wang, Megan Hofmann, Kui Wu, & Edward Chien (2025). **Curl Quantization for Automatic Placement of Knit Singularities**. *SIGGRAPH 2025.* | *project page*

Mattéo Couplet, Alexandre Chemin & Jean-François Remacle (2024). **Integrable Frame Fields using Odeco Tensors**. *SIAM International Meshing Roundtable 2024.* | *pdf*

Mattéo Couplet, Maxence Reberol & Jean-François Remacle (2021). **Generation of High-Order Coarse Quad Meshes on CAD Models via Integer Linear Programming**. *AIAA Aviation Forum 2021.* | *arXiv*

Awards

Belgian American Educational Foundation and Francqui Foundation Research Fellowship (2024). Competitive one year postdoctoral grant awarded by leading philantropy organizations.

FNRS Research Fellowship (2020). Four years PhD grant awarded to top-ranking students in Belgium.

Lhoist Berghmans Innovation Chair MIT Scholarship (2019). Scholarship is awarded to five top-ranking students at UCLouvain funding a summer research internship at MIT.

Teaching

Teaching work mainly includes preparing and supervising exercise sessions, homeworks and projects (both theoretical and programming), tutoring and grading students throughout advanced courses.

Courses: Finite Element Method, Numerical Linear Algebra, Computational Geometry, Advanced Numerical Methods