School of Digital and Physical Sciences

Annual Research Sandpit Event

Wednesday 11th of February 2026

1-3 pm

Brynmor Jones Library – Teaching Room 3

Silvio Fanzon

Mathematics

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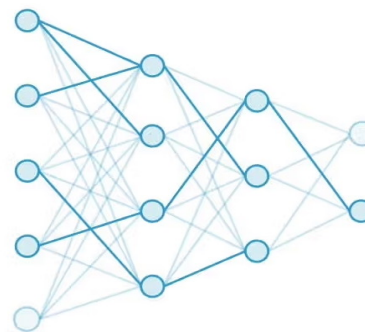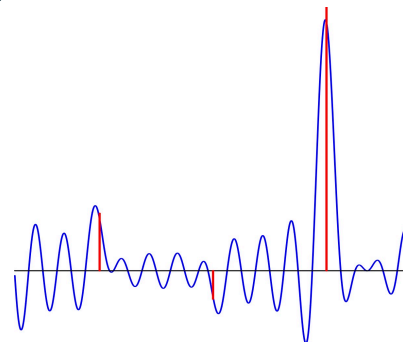
Projects with Hull students

Markov model for curling: strategy and estimation of team strengths
(*Fry, Austin, F.. Manag. Finance, 2025*)

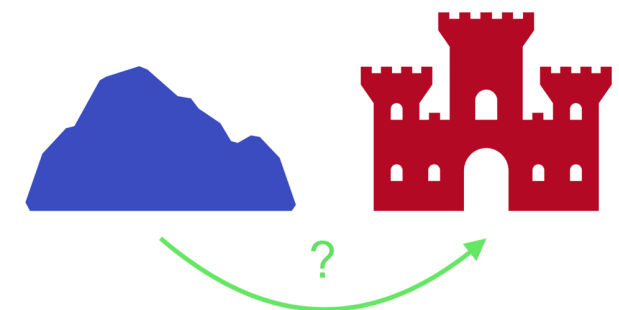Statistical Model coupling finishing times and ranks – separates drivers skill from constructor performance
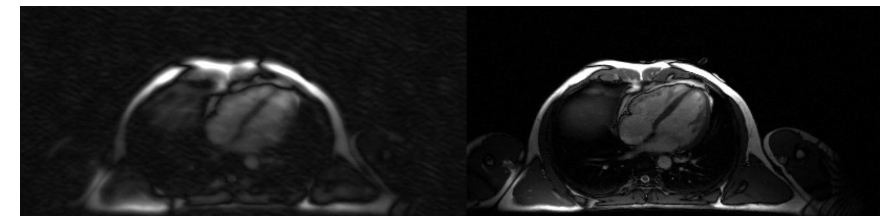(*Fry, Brighton, F.. Econ. Lett., 2024*)

Expertise

- Partial Differential Eqns
- Calculus of Variations
- Inverse Problems
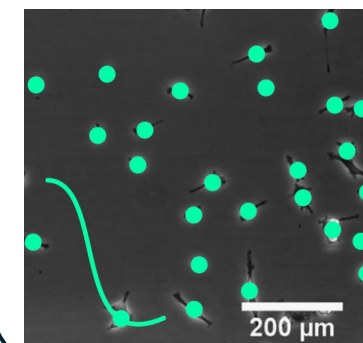- Optimal Transport
- Optimization
- Statistical Learning

Algorithms for reconstruction of **sparse** solutions to variational problems   min (F + G)
(*Bredies, Carioni, F., Romero. Bull. Lon. Math. Soc, 2021*
Bredies, Carioni, F., Comm. PDEs, 2022
Bredies, Carioni, F., Walter. Math. Programming, 2024)

Optimal Transport: What is the cheapest way to move one probability distribution into another?
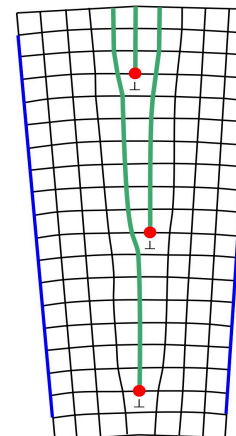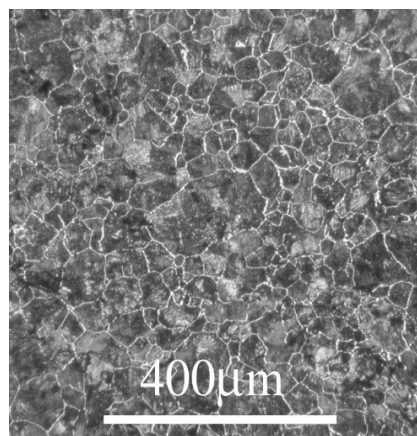**Wasserstein distance:** metric on datasets / images

Optimal transport as regularizer for Dynamic MRI
(*Bredies, Fanzon. M2AN, 2020*)

Interests / Applications

- Study of solns. to PDEs / Inv. Prob.
- Mathematical / Medical Imaging
- Materials Science
- Stat. Models in Sports / Finance
- Non-smooth optimization
- Machine Learning for Imaging

Var. models for Grain Boundaries / Dislocations
(*F., Palombaro, Ponsiglione. SIMA 2019*
F. Ponsiglione, Scala. Calc Var PDE 2020)

400μm

OT for the reconstruction of particles trajectories
Example: moving cells
(*Bredies, Carioni, F., Romero. Found. Comput. Math, 2023*)

200 μm