

Postdoctoral Researcher — Scientific Machine Learning for PDEs on Wasserstein Space

Applications will be reviewed on a rolling basis until the position is filled.

The Centre for Research in Economics and Statistics (CREST) is a scientific research institution specializing in quantitative methods applied to the social sciences. The laboratory's primary research areas are economics, finance, statistics, actuarial sciences, and sociology.

For more information, please visit the [CREST website](#).

THE POSITION

The Finance and Insurance group at CREST (ENSAE Paris) invites applications for an 18-month postdoctoral position within SLOPE (Structure-Preserving Learning of Operators for PDEs in Economics), funded by the Hi!PARIS AI Cluster. Under the supervision of Professor Jean-François Chassagneux, the successful candidate will develop machine-learning methods for PDEs on the Wasserstein space, combining physics-informed approaches with ideas from numerical analysis. The research will address equations arising in mean-field control and games, with applications in economics and quantitative finance.

KEY RESPONSIBILITIES

- Research development: Design and implement PINNs and related structure-preserving learning methods for nonlinear PDEs on the Wasserstein space, including HJB and transport equations.
- Numerical and theoretical analysis: Investigate representations and sampling of probability measures, neural architectures and neural operators, and questions of stability, consistency, solution selection and convergence whenever feasible.
- Scientific collaboration: Develop and test methods on problems from mean-field control, mean-field games and quantitative finance; collaborate with SLOPE researchers and contribute to publications and scientific dissemination.

BENEFITS

- Research environment: Join the Finance and Insurance group at CREST as part of the Hi!PARIS AI Cluster, with opportunities for collaboration in mathematical finance and machine learning.
- Scientific development: Opportunities for international academic and industrial collaboration and participation in scientific meetings.
- Research autonomy: Scope to develop independent research directions within SLOPE, adapted to the successful candidate's background and interests.

YOUR PROFILE

- Education: PhD completed or nearing completion in applied mathematics, numerical analysis, probability, machine learning, scientific computing or a related field.

- Technical Expertise: Strong mathematical background, with expertise in at least one of the following: numerical PDEs, stochastic/mean-field control and games, Wasserstein PDEs, scientific machine learning (PINNs or neural operators), or numerical probability. Machine-learning experience is desirable but not mandatory for strong mathematical candidates; Python and PyTorch skills are an advantage.
- Languages: english, french

WE OFFER

- **Contract type:** Fixed-term postdoctoral contract (CDD), 18 months, with possible extension.
- **Wage:** According to experience and ENSAE-ENSAI Group postdoctoral salary scales;
- **Working hours:** full time
- **Start date:** As soon as possible.
- **Workplace:** ENSAE Paris – CREST, Palaiseau, France.
- 25 days' vacation
- Possibility of partial remote work depending on position
- 75% reimbursement of transportation costs
- Services (company restaurant, library, postal service, hairdresser)
- Health service: physiotherapist, osteopath free of charge, on-site medical service and social worker
- Sport facilities (swimming pool, tennis courts, gym, etc.) and a variety of sporting activities
- Participation to the health insurance plan Alan, negotiated by Groupe ENSAE-ENSAI.

CONTACT

For questions about the position, please contact Professor Jean-François Chassagneux at chassagneux@ensae.fr.

Applications should be sent to chassagneux@ensae.fr. Please include:

- *A curriculum vitae, including a list of publications.*
- *A short research statement describing previous work and research interests.*
- *Contact details of two academic referees.*

Groupe ENSAE-ENSAI is committed to recruitment that promotes equality, diversity and inclusion. All applications are considered without distinction (age, disability, gender, nationality, religion, sexual orientation, etc.).

