Postdoc & PhD Positions
Project RIDING: Physics informed algorithms for sensing and navigating turbulent environments

Several positions are available in our group at University of Genova to work on turbulent navigation from a multidisciplinary perspective. Positions open until filled. *To express interest for these positions:* https://forms.gle/eP94sbHMSJbnRLDN8

The problem. *Imagine you are immersed in water. There is a target you need to reach. You cannot really see it, but you can smell the odor it releases in water, and you sense the water currents it generates as it moves. How can you reach it? Organisms solve this problem routinely to find food and mates and escape predators. But how do they process and weigh complex chemical and mechanical information? How do they make decisions? Turbulence is both the problem and the solution: it carries signals a long way, but at the same time it breaks them in disjoint and noisy patches.*

The team. We are looking for motivated, creative and collaborative postdocs and PhD students with a background in physics, engineering, applied mathematics or computer science. We are looking for several theorists and numericists and one experimentalist. We will address multisensory navigation by blending theory (stochastic models, asymptotic methods, non linear pdes), numerical simulations (computational fluid dynamics, supervised learning and reinforcement learning) and experiments (video imaging of fish catching prey in controlled turbulent conditions, PIV). Different aspects of this multidisciplinary project are conducted in collaboration with world renowned groups: Machine learning is developed in collaboration with L. Rosasco and A. Verri (MalGa DIBRIS, University of Genova) and M. Vergassola (ENS, Paris); fluid dynamics is done in collaboration with A. Mazzino (DICCA, University of Genova) and F. Viola (Gran Sasso Science Institute); behavioral experiments are performed in collaboration with N. Bellono (MCB, Harvard University) and D. Gire (U. Washington, Seattle).
We value diversity and are committed to provide equal opportunities to all candidates. We strongly encourage applicants from traditionally underrepresented communities to apply. Candidates who have children or plan to have children are welcome to apply and will benefit from financial aid and parental leave under the Italian law.

The offer. Positions come with a generous salary and travel allowance for conferences, collaborations, and visits to Harvard University and University of Washington that allow theory and experiments to fully blend. The start date for postdocs is flexible, ideally before summer 2022. The PhD program starts November 1st 2022, but official applications are due late spring/early summer. We will review applications as they come. We are part of a vibrant community that thinks about machine learning, physics and biology from an integrated point of view. We benefit from a large array of longstanding interdisciplinary collaborations providing a rich international experience, career opportunities and visibility. All positions are based at University of Genova, Department of Civil, Chemical and Mechanical Engineering (DICCA) in the group led by Agnese Seminara http://www3.dicca.unige.it/aseminara/; https://malga.unige.it/research/pimlb. Genova is a beautiful town in the Italian Riviera, squeezed between the Mediterranean Sea and the mountains with plenty of opportunities for outdoor activities, a low cost of living and a solid quality of life. The experimental postdoc will spend most of their time at Harvard University within the Bellono Lab.