Call for potential candidates for a post-doc position (maximum 2 years)
BETA, University of Strasbourg

***Research Project*:**
Artificial Intelligence in the scientific system: Diffusion and impacts

Over the last decade the interest in Artificial Intelligence (AI) and robotisation have been growing extensively, among decision makers, both private and public, as well as among economists. Most of the economic analysis, however, focus on the effects of these technologies on economic growth (Aghion et al. 2017), on the labour market and productivity dynamics (Furman and Seamans, 2019; Acemoglu and Restrepo, 2020), changes in skills (Graetz and Michaels, 2018; Bordot and Lorentz, 2020), and inequality and discrimination (O'Neil, 2016). Beyond these traditional issues raised by technological changes, AI may also entail profound changes in the structure of scientific systems. Hence, several aspects are influenced by the diffusion of AI in scientific practices, such as changes in team composition, public-private relations, speed and rate of technological breakthroughs and innovations (Cockburn et al. 2018; Agrawal et al., 2018; Bianchini et al., 2020).

The project, to which the post-doc position is attached, aims at completing our understanding of the *diffusion of AI in science and its consequences on the process of scientific development.* The overarching goal is to add some new insights into the broader question of the mechanisms through which the adoption of AI shapes the process of knowledge creation and dissemination. The targeted outcomes of the project are to provide original theoretical frames, based on the collected empirical evidence, to define and support sounder policy actions in the sphere of science, technology and innovation.

Three main and interrelated themes of interest:

1. Humans vs. Machines in the production of Science. The adoption of intelligent machines as research tool jeopardies a wide range of research tasks traditionally taken over by humans, either through a drastic drop in the cost of performing these tasks or by outperforming the human scientists. As a research tool, intelligent machines therefore question the structure and organisation of the process of production of science knowledge itself. Beyond the idea that machines can trigger short-term substitution towards capital, growing evidences show that while some tasks may be suitable for automation others may not, transforming both the nature of tasks and the corresponding skills required to produce scientific knowledge. The overall outcome on employment in science becomes more complex to address. Whether or not such a substitution effect is occurring therefore requires theoretical and empirical investigation.

2. Humans and Machines in organising Science. AI systems and robots have traditionally been used in laboratories to automate low-level repetitive tasks, such as cleaning or replacing consumables. Today human-machine relations can occur at various levels, entailing more profound actions such as deciding what to investigate, structuring a problem and interpreting experimental results. The project aims to contribute to the economics and sociology of science domain, mainly on the long-standing theoretical debate on which structures of scientific teams (i.e., size, interdisciplinary, public-private collaboration) are most conducive to more novel and high-impact science when AI becomes a major research tool.

3. AI knowledge hubs. Previous research documents a surge of AI knowledge hubs in different regions of the world, with a strong heterogeneity in terms of research focus (e.g. machine learning methods, healthcare applications), but little is known about what factors may explain the emergence of these hubs. Another intriguing aspect is the divergence between publication and patenting activities in the sphere of AI. The project aims to explain the factors underpinning these dynamics, including an attempt to establish a causal link between the convergence of science and technology.

References

Acemoglu, D., & Restrepo, P. (2020). Robots and jobs: Evidence from US labor markets. *Journal of Political Economy*, 128(6), 2188-2244.

Aghion, P., Jones, B. F., & Jones, C. I. (2017). Artificial intelligence and economic growth *(No. w23928). National Bureau of Economic Research.*

Agrawal, A., McHale, J., & Oettl, A. (2018). Finding needles in haystacks: Artificial intelligence and recombinant growth *(No. w24541). National Bureau of Economic Research.*

Bianchini, S., Müller, M., & Pelletier, P. (2020). Deep Learning in Science. *arXiv preprint arXiv:2009.01575.*

Bordot, F., & Lorentz, A. (2020). Automation and Labour Market Polarisation in an Evolutionary Model with Heterogenous Workers, mimeo.

Cockburn, I. M., Henderson, R., & Stern, S. (2018). The impact of artificial intelligence on innovation (*No. w24449). National Bureau of Economic Research.*

Furman, J., & Seamans, R. (2018). AI and the economy *(No. w24689). National Bureau of Economic Research.*

O'Neil, C. (2016). *Weapons of math destruction: How big data increases inequality and threatens democracy.* Broadway Books.

Work environment:

The candidate is expected to contribute to this project in collaboration with prof. Stefano Bianchini (project coordinator), prof. André Lorentz (project partner – themes 1 and 2) and prof. Lorenzo Cassi (project partner – theme 3). Throughout the different phases of the project, guidance and research support will be guaranteed, including on the theoretical, methodological and empirical analysis, on the policy implications and drafting of the resulting papers.

The candidate will be affiliated to the Bureau d'Economie Théorique et Appliquée (BETA). BETA is a joint research unit of the CNRS, the University of Strasbourg, the University of Lorraine, INRAE and AgroParisTech. BETA is located on five sites: Strasbourg, Nancy, Metz, Colmar and Mulhouse. Since the inception of the lab, the research conducted at BETA has been guided by the wish to articulate the theoretical aspects and applications of research in economics and management.

Beneficiaries of multiple research contracts with public authorities and private partners, BETA members target their work to the scientific community, but also to policy-makers and the general public. The staff is composed of more than two hundred members, including about a hundred researchers, fifty doctoral students, twenty engineers and administrative personnel.

Within BETA, the candidate will be integrated in the Creativity, Science and Innovation (CSI) research group in Strasbourg. This group promotes research in the fields of innovation, entrepreneurship and technological change, as well as the measurement of economic and societal impacts of innovation and science. Researchers in this group are renown for their work on evolutionary economics, economics of science, communities and organisational routines. Ongoing projects focus on the links between digital transformation and productivity, management of intellectual property and creativity. (http://www.beta-umr7522.fr)

***Other activities*:**

International missions should be planned at least once a year to participate in conferences and/or to present the work in progress.

The candidate could also be marginally involved in teaching activities within the major DS2E (Data Science for Economics and Business) or major EMI (Economics and Management of Innovation) of the Master in Economic Analysis and Policy of the Faculty of Economics and Management of the University of Strasbourg.
(http://ecogestion.unistra.fr/de/formations/masters/analyse-et-politique-economique).

***Profile*:**

The candidate must hold a PhD in economics preferably in the fields of economics of innovation and/or economics of science.

The position requires a solid background in economic modelling. The candidate should demonstrate prior experience in agent-based computational economics. Knowledge in data science, econometrics and programming skills (R and/or Python) represent a valuable asset.

Knowledge of French language is not required, but excellent ability to speak and write in English is compulsory.

The net salary is in line with the French post-doc position (2,160 € per month).

The candidate should be available to start early 2021. The post-doc position is funded by an ANR project and cannot exceed two years.

Applications consisting in a cover letter focusing on their interest and possible contribution to the project together with a curriculum vitae and a detailed list of publications must be sent to Stefano Bianchini (s.bianchini@unistra.fr), André Lorentz (alorentz@unistra.fr), and Lorenzo Cassi (Lorenzo.Cassi@univ-paris1.fr) by no later than **December 10/12/2020**.