

## **Post-Doc Position**

### **Algorithmic work in medicine**

#### **Scientific Context**

Scientists, policy makers and companies are acknowledging an algorithmic shift in the areas of health and medicine, and are even calling for it. Medical practices have long used large volumes of data, which have been processed since the 1960s by computer technologies (Hanemaayer, 2021). However, today, the mass of data to handle and their heterogeneity would be unprecedented (medical, administrative, clinical, epidemiological, and biological data; data generated via sensors, mobile applications, or connected objects; data collected on the web and social networks; and finally, data on socioeconomic, geographic, and environmental contexts) and would require the use of artificial intelligence algorithms in particular, machine learning algorithms (CNOM, 2018).

The potential uses of algorithmic technologies in health and medicine are wide-ranging. They relate to decision support or decision automation tools for diagnosis and care, the management of healthcare provision, health monitoring, and prevention and early detection.

In addition to medico-economic expectations (improving the quality of care and reducing healthcare costs), new paradigms are emerging, such as precision medicine (precision diagnoses and individualized treatments), integrative or person-centered medicine (the ability to understand health trajectories), and participatory medicine (patients as actors in their health) (Greene & Loscalzo, 2017).

Most of social science research on artificial intelligence algorithms in medicine focuses on legal issues (data privacy; legal responsibilities in case of harm resulting from the use of an automated decision-support system) and ethical issues (in particular, algorithmic biases in machine learning methods (Pot et al, 2021).

On the other hand, few empirical investigations have been conducted on the different facets of algorithmic work in medicine, including:

- the work involved in producing and linking data (Bossen et al., 2019), and in developing knowledge infrastructures such as data warehouses;
- the design of an algorithm to support medical decision, sometimes derived from a previous tool (e.g., the calculation of a risk score for cardiovascular diseases, Amelang & Bauer, 2019);
- the work of professionals and patients to use an algorithm in a situation of prevention or diagnostic (Fiske et al. 2019; Bailey et al. 2021);
- the reconfiguration of a care relationship through the use of an algorithmic, for example, in the context of virtual assistant-guided therapy (Schwennesen, 2019).

#### **Role of the post-doctoral researcher**

The proposed post-doctoral position aims to develop sociological knowledge of algorithmic work in medicine, particularly on the following topics: emergence of new competences (among

medical professions and patients); destabilization and transformation of professional expertise; development of interdisciplinary and interprofessional collaborations; inclusion of AI technologies in organizational functioning.

The post-doctoral researcher will conduct an in-depth field investigation on one or several projects involving the design and implementation of an algorithm in a medical environment.

He/she will analyze the different aspects of algorithmic work, from the production of data to the uses of the algorithm.

The study sites will be chosen at the beginning of the post-doctoral research, among the projects conducted by research and medical teams involved in the Auvergne-Rhône-Alpes region in the development of AI technologies for medicine.

The post-doctoral fellow is expected to publish his or her research - alone or in collaboration with MIAI researchers - in national or international peer-reviewed journals.

### **Position in the organization**

The post-doctoral fellow will be hosted in the PACTE laboratory's Regulations team and will be attached to the MIAI Algorithmic Society Chair. He or she will work in close collaboration with the researcher coordinating the project : Séverine Louvel (Assistant Professor in Sociology at Sciences Po Grenoble). He or she will be attached to the MIAI Grenoble Alpes Institute (<https://miai.univ-grenoble-alpes.fr/>) and associated with the Algorithmic Society chair (<https://algorithmicsociety.github.io/>)

### **Desired profile**

- PhD in sociology of health and/or social studies of science and technology
- Very good knowledge of interviewing and ethnographic observation
- Very good level in English
- Prior knowledge of AI technologies is not a prerequisite, however, familiarity with the issues of health data and the algorithmic turn of societies will be an asset.

### **Work environment**

The post-doctoral fellow will be recruited for a period of 12 months starting October 1, 2021. The proposed salary corresponds to the employment grid for contractual researchers (young researcher HS03, i.e. a salary between 2395 and 3847 € gross monthly). All expenses related to the post-doc (material environment, travel, etc.) will be covered by the Chair.

Candidates must send their application to the following address before July 1<sup>st</sup> : [severine.louvel@iepg.fr](mailto:severine.louvel@iepg.fr). It should include :

- A letter of application (in French or in English);

- The PhD diploma and the thesis defense report;
- A CV
- A letter of recommendation appreciating the capacity to carry out the project (in French or in English).

## References

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- Bailey, S., Pierides, D., Brisley, A., Weisshaar, C., & Blakeman, T. (2020). Dismembering organisation: The coordination of algorithmic work in healthcare. *Current Sociology*, 68(4), 546-571.
- Bossen, C., Pine, K. H., Cabitza, F., Ellingsen, G., & Piras, E. M. (2019). Data work in healthcare: An Introduction. *Health Informatics Journal*. 25(3), 465-474.
- Conseil National de l'Ordre des Médecins (2018). Médecins et patients dans le monde des algorithmes, des data et de l'intelligence artificielle, Livre blanc.
- Fiske, A., Prainsack, B., & Buyx, A. (2019). Data work: meaning-making in the era of data-rich medicine. *Journal of medical Internet research*, 21(7), e11672.
- Greene, J. A., & Loscalzo, J. (2017). Putting the patient back together-social medicine, network medicine, and the limits of reductionism. *The New England journal of medicine*, 377(25), 2493-2499.
- Hanemaayer, A. (2021). Don't touch my stuff: historicising resistance to AI and algorithmic computer technologies in medicine. *Interdisciplinary Science Reviews*, 46(1-2), 126-137.
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