

Postdoctoral Researcher/Research Engineer Position on “Multimodal Graph Generative Models with applications to bio/medical domain”

@DaScim, LIX, Ecole Polytechnique, Paris, France

<https://www.lix.polytechnique.fr/dascim/>

Graph generative models are recently gaining significant interest in current application domains. They are commonly used to model social networks, knowledge graphs, and protein-protein interaction networks. The research to be conducted during this project will capitalize on current results of the group on generative models for proteins and graphs[1][2]. We will investigate the challenges of multi modality in the context of defining architectures for graph generation under the proper prompt. We expect our designed architectures to be useful in different areas including molecule design, medical data generation, bio related data .

Candidate Profiles Candidates must have at least two of the following

- a recent PhD degree in either Computer Science, Mathematics, Chemistry, Biology or Physics,
- analytical skills and creative thinking with a hard working attitude,
- good programming skills in deep learning (Python Pytorch).

Ideally we are also searching for candidates with the following desired qualifications

- strong mathematical background (including Probability, Statistics and Linear Algebra),
- Machine and Deep Learning skills (architecture design and optimisation, good understanding of Transformers or Graph Neural Networks),
- an understanding of biological application domains,
- a sound publication record with visible impact.

Funding

The funding for this position is available for 24 months renewable.

Applications Interested candidates should send an email addressed to Michalis Vazirgiannis (mvazirg@lix.polytechnique.fr) *by April 2, 2024* and attach the following

- a cover letter including a brief presentation of their academic record and motivation as well as relevant skills and experience.
- a full CV with detailed grading information for the acquired degrees.

We will interview candidates on a rolling basis and will aim to fill this position as soon as possible.

Location

This position would require you to work from our offices in the *Computer Science Laboratory of 'Ecole Polytechnique in the broader area of Paris*.

'Ecole Polytechnique is the premier engineering University of France and a founding member of the recently established Institut Polytechnique de Paris (which entered the international rankings in high positions). Famous scientists (including Nobel prize recipients) and industrial

leaders are alumni of the school, offering an exceptional environment for research in the fast growing excellence pole of Saclay, hosting a rich ecosystem of industrial and academic research centers a few kilometers south of Paris. Additionally, it offers ample computing and recreation resources and facilities on the University campus. The Data Science and Mining group, in which you would be integrated, has already had significant impact in local and international research and industrial activities with several high-impact publications and successful industrial projects.

Timeline.

- Application deadline: April 2, 2024
- Contract start: any time before September 2024

[1] Prot2Text: Multimodal Protein's Function Generation with GNNs and Transformers

H. Abdine, M. Chatzianastasis, C.Bouyioukos, M. Vazirgiannis, AAAI 2023,

<https://arxiv.org/abs/2307.14367>

[2] Neural Graph Generator: Feature-Conditioned Graph Generation using Latent Diffusion Models

Iakovos Evdaimon, Giannis Nikolentzos, Michail Chatzianastasis, Hadi Abdine, Michalis Vazirgiannis,

<https://arxiv.org/abs/2403.01535>