Job Offer: Dynamic Visualization of Social Interaction Network in Preschool

Starting date: September 1st, 2025

Application deadline: June 15, 2025

Interviews: between June 18 and June 25, 2025

Salary: ~2300€ gross/month (social security included)

Mission: research oriented (teaching possible but not mandatory)

Place of work: Laboratoire d'Informatique de Grenoble, Univ. Grenoble Alpes, France

Keywords: Interactive Information Visualization, Dynamic Interaction Networks

Description

As part of the chair *Socialization and Language at School: An Opportunity and a Challenge for AI in the Exploitation of Massive Data (SoLaS)*, funded by the MIAI Cluster, we offer a PhD position focused on dynamic visualization for exploring social interaction networks in a preschool setting. The PhD will leverage data collected as part of the DylNet project (*Language dynamics, linguistic learning, and sociability at preschool: benefits of wireless proximity sensors in collecting big data* <ANR-16-CE28-0013>; https://dylnet.univ-grenoble-alpes.fr/).

Over a period of two and a half years, one week per month, approximately 200 individuals (children, teachers, and school staff) in a socially mixed preschool were equipped with wireless sensors. These sensors recorded both the proximity between individuals (with measurements taken every 5 seconds via RSSI signal exchange) and their speech. In total, 655,958,381 RSSI signals were collected, corresponding to 1,705,126 social interactions. The data is available in the form of matrices that provide, for each dyad and each individual over time, the number of contacts and the duration of interactions during classroom and free time. This large-scale dataset also includes sociodemographic information on participants and their level of language development (Dai et al., 2022; Dai et al., 2020).

The objective of this PhD is to develop exploration tools adapted to this dataset and usable by researchers in the field of Social Sciences and Humanities. Although visualization techniques for dynamic networks already exist, the challenge with the DyLNet data lies both in its sheer volume and in accounting for multiple temporal scales of differing orders of magnitude. Furthermore, an understanding of the issues relevant to research in the Social Sciences and Humanities will be essential for designing effective visualization tools. The PhD will be co-supervised by Laurence Nigay, researcher in human-computer interaction, R. Blanch, researcher in information visualization, and A. Nardy, researcher in language acquisition.

More specifically, the PhD will involve:

- Conducting a literature review on the visualization of dynamic networks
- Implementing a methodology to become familiar with research issues in the Social Sciences and Humanities and to gather user needs
- Designing and implementing prototypes
- Defining a methodology to evaluate the tool

Required skills:

- Master's degree in Computer Science, preferably with a specialization in HCI, visualization, or computer graphics
- Proficiency in at least one programming language and associated graphics libraries (e.g., C++/Python/JavaScript, OpenGL/D3, etc.)
- Interest in and openness to Social Sciences and Humanities
- Excellent communication skills in French or, alternatively, in English

Scientific environment:

The PhD will be supervised by Laurence Nigay (LIG, Université Grenoble Alpes), Renaud Blanch (LIG, Université Grenoble Alpes), and Aurélie Nardy (Lidilem, Université Grenoble Alpes). The recruited person will be affiliated with both LIG and Lidilem, and will be hosted within the IIHM team at LIG laboratory (https://iihm.imag.fr/), which has strong expertise in human-computer interaction and information visualization. The team provides a stimulating, international work environment and offers the necessary resources for carrying out the PhD, both in terms of equipment and scientific collaboration. Regular meetings with all three supervisors will be held throughout the duration of the PhD.

Instructions for applying

Applications should include a CV, a letter of motivation, and a transcript of Master's degree grades. One or more letters of recommendation may also be included. Applications should be sent to Renaud Blanch (renaud.blanch@univ-grenoble-alpes.fr) and Aurélie Nardy (aurelie.nardy@univ-grenoble-alpes.fr).

References

Dai, S., Bouchet, H., Karsai, M., Chevrot, J.-P., Fleury, E., Nardy, A. (2022). Longitudinal data collection to follow social network and language development dynamics at preschool. *Scientific Data*, 9, Article 777. https://doi.org/10.1038/s41597-022-01756-x

Dai, S., Bouchet, H., Nardy, A., Fleury, E., Chevrot, J.-P., Karsai, M. (2020). Temporal social network reconstruction using wireless proximity sensors: model selection and consequences. *EPJ Data Science*, 9, Article 19. https://doi.org/10.1140/epjds/s13688-020-00237-8