

# CS PhD Seminar Series

May 12th

14:30-15:30

Room 214

## From Population Patterns to Patient Profiles: A Digital Twin Approach to Glucose Simulation in Adolescents with Type 1 Diabetes

Managing blood glucose in adolescents with type 1 diabetes (T1D) is particularly challenging due to the combined effects of physical activity, irregular eating habits, and developmental changes in insulin sensitivity. This study presents a two-stage generative framework that learns patient-specific glucose dynamics in adolescents with T1D. First, a variational autoencoder (VAE) is pre-trained across the full patient population using a leave-one-out strategy, capturing shared metabolic patterns. Second, the model is fine-tuned on each individual patient's data, adapting to personal glucose behavior. To address distributional biases introduced by KL divergence over-regularization, we apply an affine calibration step that corrects the mean and variability of the generated traces via a linear transformation matching the sample mean and variance of the observed data. The framework is validated against real-world continuous glucose monitoring (CGM) and wearable sensor data from the pediatric cohort T1DEXIP and a real-world fine-tuning cohort of 12 adolescents. Results demonstrate that personalized, generative glucose modeling with only limited individual data is both feasible and clinically meaningful.

Speaker: [Anna Khristodulo](#)



Anna Khristodulo is a PhD candidate in Computer Science at the University of Genova (in collaboration with Gaslini Hospital), specializing in the application of Generative Artificial Intelligence to medical data analysis. Her research is focused on building generative models — including GANs, VAEs, and cGANs — for the simulation and augmentation of paediatric Type 1 Diabetes Mellitus (T1DM) datasets. She has a strong interdisciplinary background combining information security, data science, and clinical research. She has just completed a PhD internship at the University of Girona (Dexcom Chair), Spain.

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## Watermarking LLM: Why, How and Generated Future

I recently came across a video on LLM watermarking. The video was extremely informative and full of inconsistencies and crude concepts, but it sparked some questions and interests that I thought it was worth sharing. The study of LLM watermarking is, of course, very recent and very intriguing: it involves hiding a signature within text without altering its meaning and without using metadata.

In this seminar, we'll try to understand how a generated text can be watermarked, what this means for users, and make some assumptions about the future: should these techniques be made mandatory? And if so, how will this change the way we perceive "generated" content?

Speaker: [Andrea Gatti](#)

Andrea Gatti is a third-year PhD student in Computer Science at the University of Genoa. He graduated with a Bachelor's degree in Informatica in 2020 and a Master's degree in 2022 in Computer Science at the University of Genoa. His main interests are multi-agent systems and in particular their intersection with Natural Language Processing and Virtual Reality. He is working under the supervision of Prof. Viviana Mascardi in the development of VEsNA (Virtual Environments via Natural language Agents), a framework which has the ambitious goal of creating logical agents capable of interacting in natural language with users with whom they share the same virtual space.

