

S. Allassonnière : Intelligence artificielle en santé : actualités et perspectives.

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Along my years in the CMAP, I have been able to work with my students on several projects that I will quickly describe here.

First we have provided coherent framework for studying cross-sectional, multimodal and longitudinal manifold-valued data. We have introduced Bayesian mixed-effect models which allow to estimate both a group-representative piecewise-geodesic trajectory in the Riemannian space of shape and inter-individual variability. We have proved theoretical guarantees of the models and the optimisation algorithms. The practical use of these models has led to the creation of a startup named Qairnel.

In this second work we investigate a model-based reinforcement learning approach for a sequential decision making problem in a rare obstetrical disease diagnostic task. The specificities of our case study, namely the data scarcity, the lack of expert demonstration from which we could learn, and the importance of domain knowledge combined with high-dimensionnal issues lead us to an original model learning algorithm proposition. This led to the creation of Sonio.

I will end with a new research topic about data augmentation to accelerate clinical trials.