

# Exponential convergence towards consensus for non-symmetric linear first-order systems in finite and infinite dimensions

*Tuesday, October 17, 2023 2:00 PM (1 hour)*

I will first recall some results on how to achieve consensus for well known classes of systems, like the celebrated Cucker-Smale or Hegselmann-Krause models. When the systems are symmetric, convergence to consensus is classically established by proving, for instance, that the usual variance is an exponentially decreasing Lyapunov function: this is a “ $L^2$  theory”. When the systems are not symmetric, no  $L^2$  theory existed until now and convergence was proved by means of a “ $L^\infty$  theory”.

In this talk I will show how to develop a  $L^2$  theory by designing an adequately weighted variance, and how to obtain the sharp rate of exponential convergence to consensus for general finite and infinite-dimensional linear first-order consensus systems.

If time allows, I will show applications in which one is interested in controlling vote behaviors in an opinion model. This is a work in collaboration with Laurent Boudin and Francesco Salvarani.

**Presenter:** TRÉLAT, Emmanuel (Sorbonne Université)