



AGENT - BASED SIMULATION TO THINK ABOUT THE AGRICULTURE OF TOMORROW

Prof. Patrick Taillandier
INRAE, MIAT/ Ird, Umi Ummisco

ABSTRACT

Recent years have been marked by an increase in the global awareness of the need for more sustainability in agriculture. New technologies offer a unique opportunity to optimise the use of chemical inputs, to monitor ecosystem services, adapt to and mitigate climate change, better disseminate good practices, etc. However, these technologies raise many questions about the negative effects they could cause (inequalities between farmers, industrialisation of agriculture, capital required etc.). In this presentation, I will speak about a project I am leading on the use of communicating water meters for irrigation among farmers in the South-East of France: how the opinion of the farmers on these technologies is built, how it is spread, what is the impact of introducing new messages to promote these tools among farmers? These are some of the questions we wish to address with the help of agent-based simulation. Agent-based simulation is recognised as a particularly well-suited simulation approach to represent system properties emerging from interactions between (human) agents. This

approach consists in explicitly representing the structure and dynamics of entities composing the studied system. It enables to take into account inter-individual heterogeneity, social interactions, and complex human-environment interactions. Some of the preliminary results obtained with the model will be presented.

- **Short Bio:** Patrick Taillandier obtained a master's degree in AI in 2005 and a PhD in 2008 at the University of Paris Est (COGIT - IGN laboratory). After working two years for the MSI research team (IFI - Hanoi, Vietnam) and one year for the SMAC research team (IRIT - Toulouse, France), he was recruited in 2011 as associate professor by the University of Rouen. Since 2016 he is a researcher (senior researcher since 2020) at INRAE (MIAT, Toulouse, France). His research topic concerns the use of the agent-based simulation to model socio-ecological systems. He was the coordinator of several important projects that concerned the modelling of human behavior. He is also the coordinator of the "modelling and simulation" axis of the French convergence institute #Digitag on digital agriculture.