

## **Intro to Agent-Based Modeling (ABM) through Modeling Mass Opinion Dynamics**

### **Description:**

This tutorial session will demonstrate building some basic agent-based models (ABM) of population opinion dynamics in NetLogo. It will start by exploring various published opinion dynamics models (e.g. Zaller-Deffuant model). It will then continue with specific NetLogo topics such as implementing network models and extracting data from models for analysis.

### **Who Should Attend?**

This tutorial is aimed at two groups: 1) people who have little experience with ABM (particularly NetLogo) and would like to develop their skills with an interesting social science problem, 2) people who have some ABM experience and would like to explore a few ways of modeling opinion dynamics using ABM.

### **Concepts Covered:**

Attendees should leave the tutorial with basic competence in using NetLogo. Additionally they'll be exposed to:

- the Zaller-Deffuant model of mass opinion (and variations)
- translating mathematical statements into NetLogo code
- building models incrementally, adding complexity in successive steps (e.g. "always have a working model")
- exploring different ways of drawing random numbers from various distributions in NetLogo
- using NetLogo's network capabilities to build network-based models
- extracting data from runs of NetLogo models for analysis in other tools (e.g. R, Python, Excel, etc.) using Behavior Space or exporting directly to CSV from model code
- comparing model code written in other languages (e.g. Fortran) with code in NetLogo
- accessing models and code stored on a Git repository

### **Computer/Software Requirements:**

While spectators are welcome, this instructor-led tutorial is designed to be a hands-on effort and attendees will get the most out of it by working through the exercises. We will be using NetLogo (<https://ccl.northwestern.edu/netlogo/>) and ideally it will already be installed on the attendee's computer before the session begins.

### **Instructor Biography:**

Dale Frakes is a Ph.D. candidate in the Systems Science program at Portland State University, working under Dr. Wayne Wakeland. He developed and teaches a course, "Modeling & Simulation with R & Python" as well as teaching the program's course in Agent Based Modeling. He is currently working with two academic teams applying computer modeling to research on "Fake News" and Intergenerational Obesity.

### **References:**

Pawel Sobkowicz, "Extremism without extremists: Deffuant model with emotions" (<https://www.frontiersin.org/articles/10.3389/fpsy.2015.00017/full>).

Krzysztof Malarz, Piotr Gronek, Krzysztof Kulakowski, "Zaller-Deffuant model of mass opinion" (<https://arxiv.org/abs/0908.2519>)