

# REIMPLEMENTING THE FRISHEEPING HERDING ALGORITHM USING FUZZY LOGIC

Noah Novšak, Veljko Dudić, Petra Kuralt, Timotej Košir

# OUR MAIN GOALS

Reimplementation of fuzzy logic for FRIsheeping

- Introducing dynamic environments

**1** Research the initial  
Strombom model

**2** Implement fuzzy  
Strombom model

**3** Implement fuzzy  
Herding model

# STRÖMBOM MODEL

$$H'_i = hH_i + cC_i + a\hat{R}_i^a + s\hat{R}_i^s + e\epsilon.$$

$H_i$  Previous sheep's direction

$C_i$  Attraction to other sheep

$\hat{R}_i^a$  Repulsion from other sheep

$\hat{R}_i^s$  Repulsion from shepherd

$\epsilon$  Inertia

————→ **New heading**

# FUZZIFICATION OF THE STRÖMBOM MODEL USING OCEAN

Openness

Conscientiousness

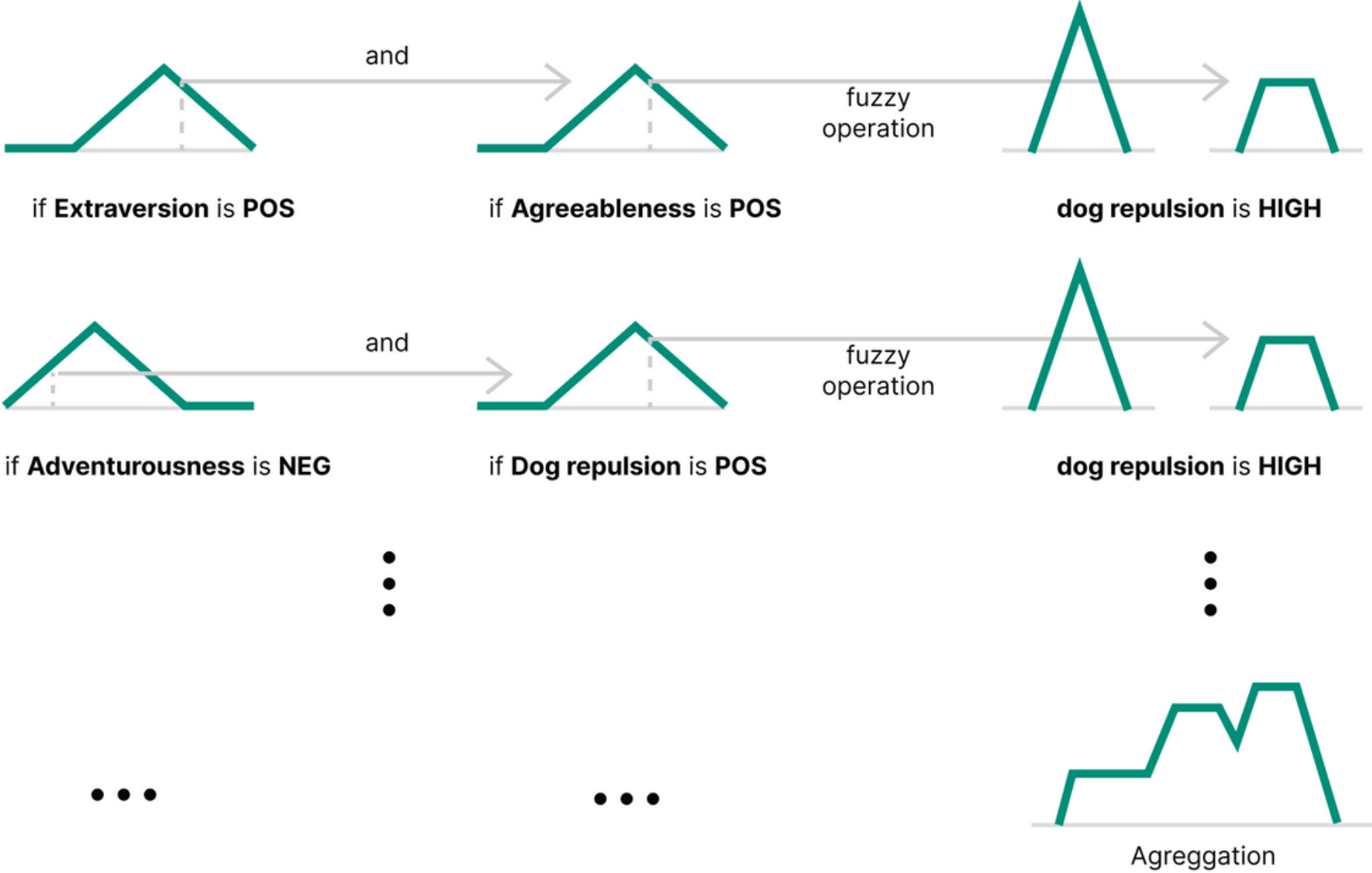
Extraversion

Agreeableness

Neuroticism

Strombom inputs

**OUTPUT: Strombom parameters**



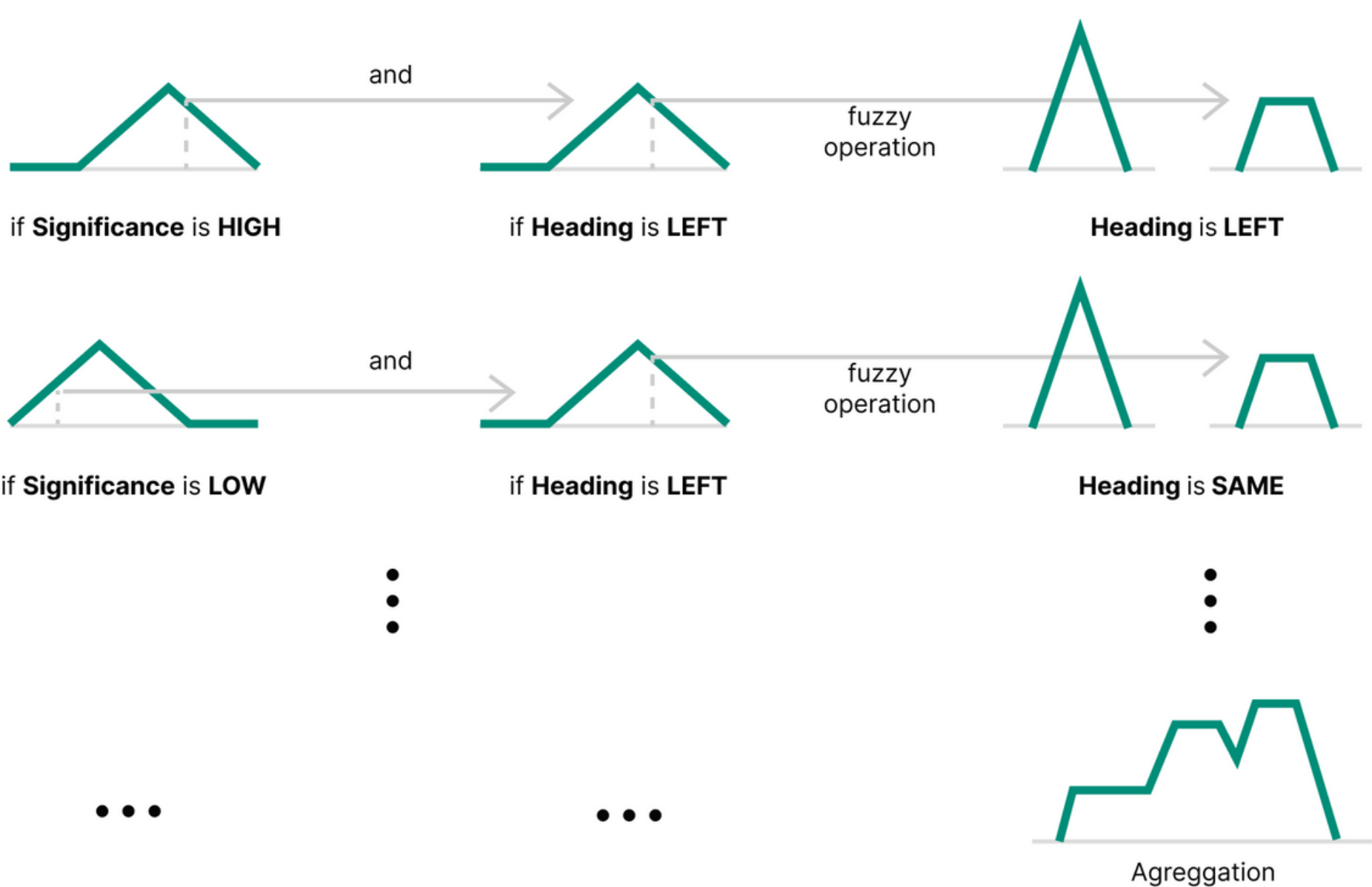
# FUZZY HEARDING ALGORITHM

Heading

Speed

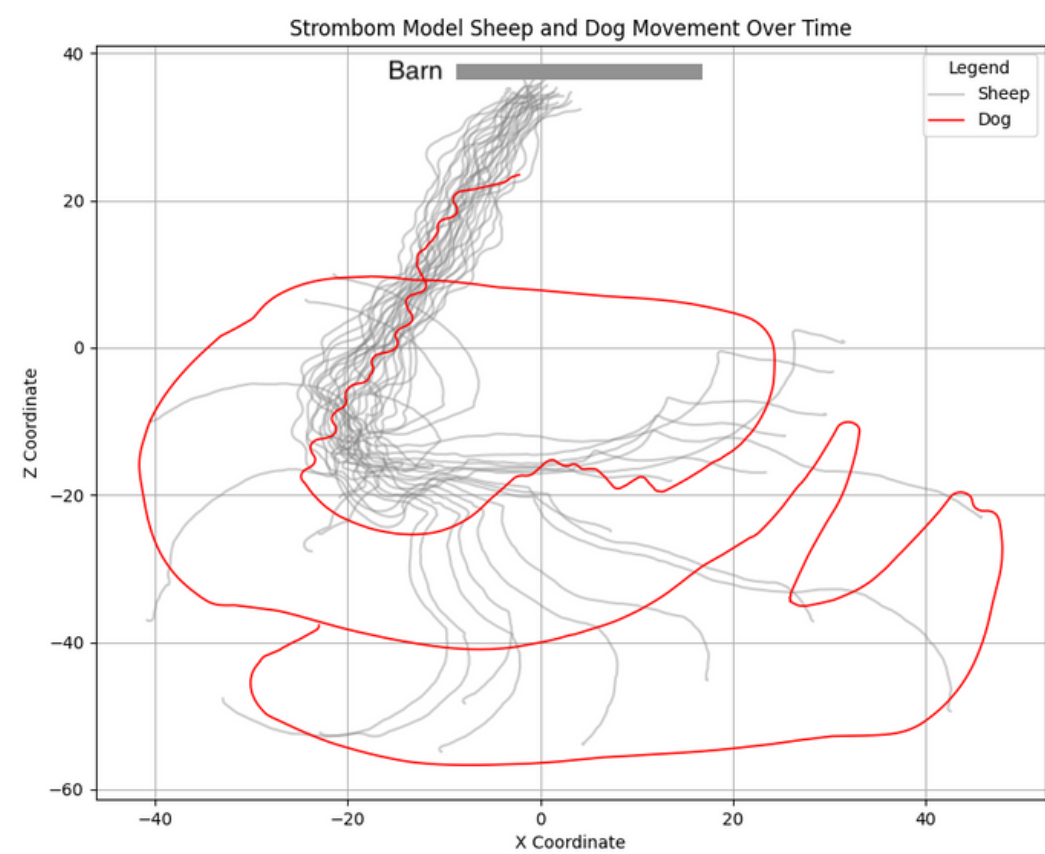
Significance

OUTPUT: Direction and Speed

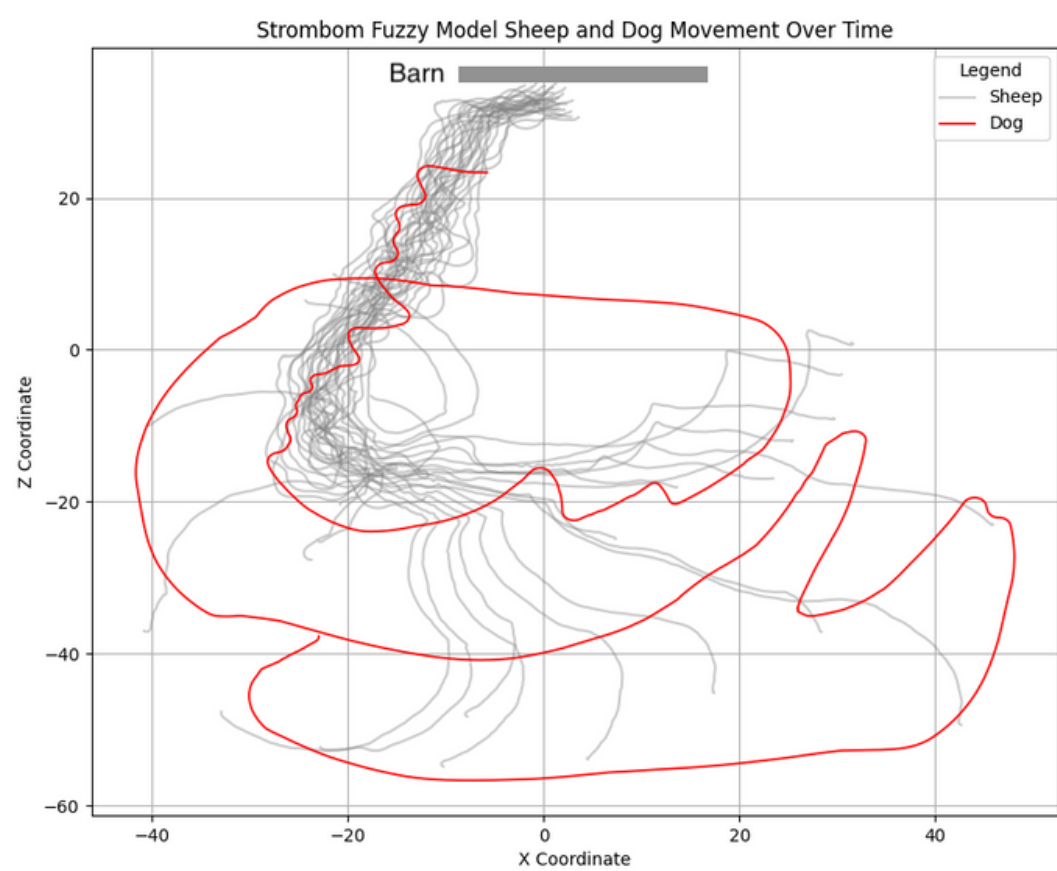


# SIMULATIONS

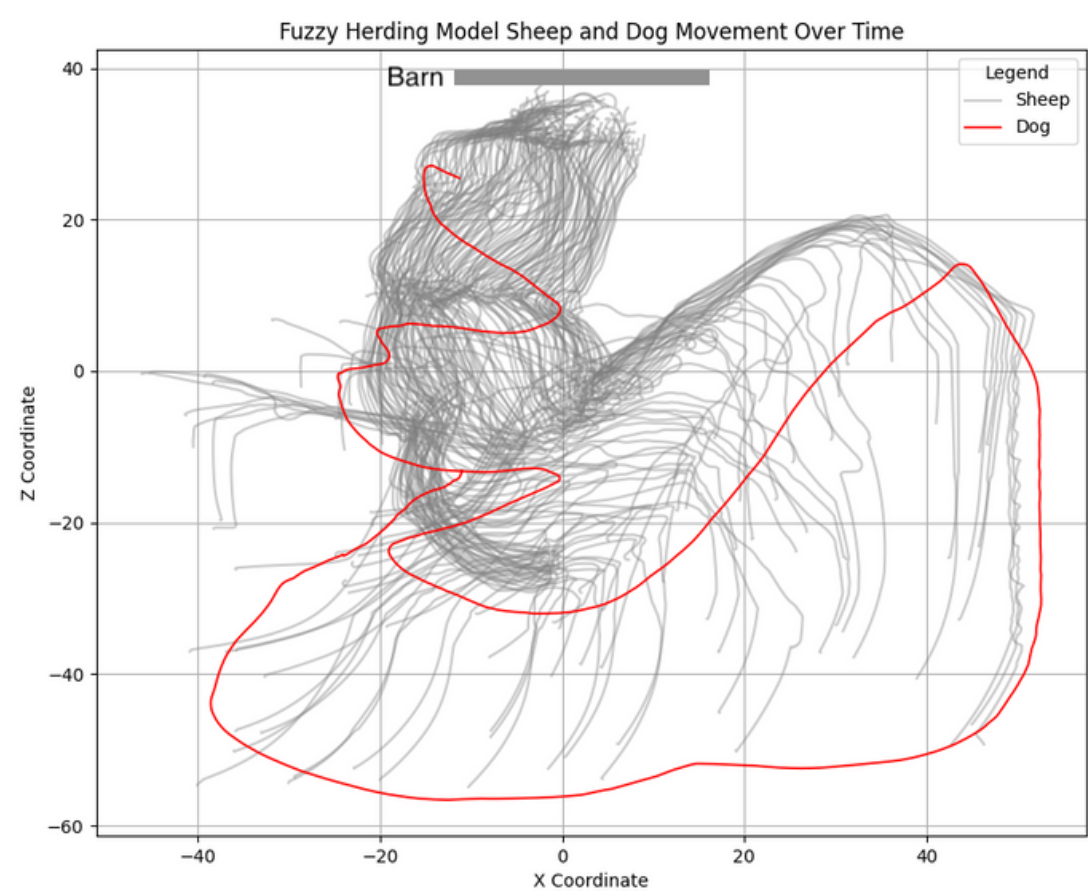
Strombom algorithm



Fuzzy Strombom algorithm



Fuzzy Heading algorithm





# IMPROVEMENTS

**Fuzzy Herding - center of mass problem**

**Fuzzy Herding - occlusion**

**Different visualization techniques**

# DEMO





# THANK YOU

