Anna Kinga Zafeiris, Ph.D.

Computational Modeler | Complex Systems | AI & Collective Behavior

Interdisciplinary researcher with 15+ years of experience in modeling biological and social systems. Expert in collective behavior, opinion dynamics, and adaptive systems, combining tools from statistical physics, network science, agent-based modeling, and machine learning. Strong academic background and participation in EU-funded projects, with applications ranging from healthtech and anomaly detection to social coordination and evolutionary modeling.

Core Competencies

• Collective behavior modeling • Agent-based simulations • Opinion dynamics
• Network science • Adaptive self-organization • Anomaly detection
• Machine learning (Python, scikit-learn) • ESM-2 protein modeling
• Optimization algorithms • Scientific computing (NumPy, Pandas, MATLAB)

Selected Experience & Projects

• Modeled immune cell behavior, bacterial swarming, and human group coordination via agent-based simulations.
• Developed models of belief formation and consensus in dynamic social networks.
• Modeled protein mutation pathways using ESM-2 for evolutionary tree reconstruction.
• Participated in EU-funded H2020 RedAlert and Inflanet projects on radicalization and inflammation modeling.

Key Publications

• Zafeiris & Vicsek (2018), *Why we live in hierarchies*, Springer
• Zafeiris (2022), *Opinion polarization*, Entropy
• Berekméri & Zafeiris (2020), *Collective decision making*, Scientific Reports

Contact & Profiles

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