FAU
CHARLES E. SCHMIDT COLLEGE OF SCIENCE
Department of Mathematical Sciences
Florida Atlantic University

The FAU-SIAM student chapter invites you to a talk by

Nancy Rodriguez, Ph.D.

Assistant Professor, CU Boulder

A story on relocation strategies, the Allee effect, and the Ideal Free Distribution

Thursday March 18th, 2021, 11:00am EST

Open to all

Live on Zoom (Meeting ID: 829 1824 9336, passcode: Spring2021)

Abstract

It is well known that relocation strategies in ecology and in economics can make the difference between extinction and persistence. In this talk I present a unifying model for the dynamics of ecological populations and street vendors, an important part of many informal economies. I discuss the effects of chemotactic movement of populations subject to the Allee Effect by discussing the existence of equilibrium solutions subject to various boundary conditions and the evolution problem when the chemotaxis effect is small. On an interesting note, I present numerical simulations, which show that in fact chemotaxis can help overcome the Allee effect as well as some partial analytical results in this direction. I will conclude by making a connection to the Ideal Free Distribution and analyze what happens under competition, showing that the Ideal Free Distribution is locally evolutionarily stable.

About the speaker

Dr Rodriguez graduated from UCLA in 2011 and she is now assistant professor in the department of applied mathematics at CU Boulder. Her research focuses on nonlinear partial differential equations (PDEs), in particular those with applications to urban crime, segregation, biological aggregation, chemotaxis, and ecology. Fundamentally, she is interested in the mathematical modeling and the use of numerical and mathematical analysis to shed light into social, biological and ecological systems. She has contributed to the advancement of the theory for non-local PDEs and have brought insight into crime propagation and prevention, social segregation, and pest-control.

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