CCSU

DEPARTMENT OF MATHEMATICAL SCIENCES

COLLOQUIUM

Friday, April 22
3:00 – 4:00 PM
Maria Sanford, Room 101

IMPROVING PARAMETERS ESTIMATION FOR INTEGRAL PROJECTION MODELS IN FLUCTUATING ENVIRONMENTS

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Abstract: In the field of biological and ecological sciences, matrix projection models (MPMs) are one of the most widely used approaches to evaluate population and environmental dynamics. A significant reason why MPM is so popular in modern biological sciences is its simplicity and ease of explaining results. MPMs, however, transform continuous traits into discrete stages, which may underestimate or overestimate population dynamics. Integral projection models (IPMs) can be used to avoid these artificial breakpoints. With their improved performance, IPMs are gaining popularity in forest and wildlife ecology. While IPMs have advantages over MPMs, existing IPMs estimation techniques are sensitive to outliers or mixing of population traits. We propose a robust fitting approach for IPMs, and we examine how the gain in robustness in the continuous size variable affects the estimation of population growth rate by using a simulation study. We demonstrate the benefits of the proposed approach by analyzing the population dynamics of African elephants (Loxodonta africa) in Amboseli National Park, Kenya, where drought is thought to influence the population dynamics.

Remark: This presentation will be online, but you are welcome to come to room MS101 to enjoy the presentation together.

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For further information: gotchevi@ccsu.edu; 860-832-2839; https://web.ccsu.edu/colloquium/