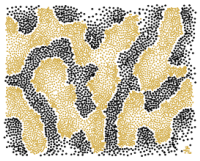
PURDUE UNIVERSITY | Department of Mathematics

Project-based research

Project Name:	Mathematical Developmental Biology	**Project ID:**	Leave Blank
Supervisor:	Alexandria Volkening	**Number of Positions**	2
Project Description:	My group takes a mathematical approach to understand how patterns and tissues form in developing plants and animals. For example, we are interested in understanding how stripe patterns form in the skin of zebrafish and how cells change their shape as ferns grow and reproduce. We draw on tools from mathematical modeling, data science, topological data analysis, and other areas, and we work closely with experimental data from collaborators. As an example, for more information about my group's work on zebrafish, see http://alexandriavolkening.com/agentBased.html. There are different types of projects available based on fit and interest.		
Final Deliverables:	My prior undergraduate-student projects have resulted in 2 publications with student co-authors, media coverage, poster awards, and 2 presentations at the Joint Mathematics Meetings. I will encourage you to share your research and help you prepare for this.		
Weekly Working Hours	- Average of 9 hours per week during the semester - Full time during the summer		
For Credits/Voluntary	For credits during the academic year: 3 credits per semester For funding during the summer if the project continues		
Desired Qualifications	Required: Driven students who are strong communicators, good writers, good team members, and excited about interdisciplinary research; background in linear algebra and differential equations; strong programming skills; willingness to continue the same project for at least two semesters or one semester and summer.		

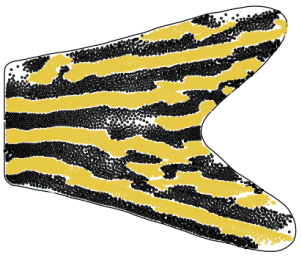
Undergraduate Research Opportunity:
Mathematical Biology @ Purdue
with Alexandria Volkening



Who: Undergraduates excited about **mathematical & computational research**

When: Projects available starting Fall 2022 and Spring 2023

What: Mathematical modeling, data analysis, machine learning, image processing, and software development to understand pattern formation in developmental biology



Interested in applying? **Email** Prof. Volkening (avolkening@purdue.edu)

Please include your resume, unofficial transcript, info about your programming or other relevant experience, and a paragraph about what building an inclusive research community means to you & why it is important.

{more info}

Programming experience (preferably Matlab, Python, or JavaScript), differential equations, and linear algebra are required; prior research experience is not necessary. We are looking for students interested in continuing research for at least 2 semesters or at least 1 semester and summer. Funding (including over the summer) or course credit may be available. Past projects have resulted in 2 publications with undergraduate co-authors and 4 student research prizes.

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