

# Shayne M. Plourde (He/Him/His)

Columbus, OH

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## Overview

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My training in Mathematics, Computer Science, and Biology allows me to investigate questions at the cutting edge of computational biology. This allows for a high level of interdisciplinary collaboration and efficient communication. I am excited to bringing new groundbreaking ideas to mathematical biology.

## Skills Summary

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- **Laboratory:** Confocal Microscopy, Image Analysis, Experimental Design, Scientific Writing
- **Model Organisms:** *C. elegans*, *H. vulgaris*, *A. thaliana*, *S. cerevisiae*, *E. coli*
- **Programming:** Googling, Documentation, Data Analysis, Parameterization, ODE/PDEs, OOP
- **Languages:** Python, Matlab, R, C/C++, JAVA
- **Skills:** Management, Writing, LaTeX, Collaboration, Public Speaking, Bioinformatics, Independence

## Projects

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- **Mathematical and Biological Exploration of Cellular Patterning and Positioning**
  - **Developed:** a PDE model of *C. elegans* embryo centrosomes to identify maturation asymmetries.
  - **Acquired and Analyzed:** microscopy data for use in parametrizing the PDE model. This formed the basis for understanding the mechanisms responsible for the observed asymmetries.
- **Mathematical Modelling of Pollen Aperture Formation**
  - **Developed:** a Turing model of aperture positioning that recapitulated *Arabidopsis thaliana* pollen surface patterning and predicted the behaviour of a novel mutant before *in vivo*.
- **Computational Model of Microcalcification Growth**
  - **Designed:** an agent based JAVA model of breast tumor growth. The fractal dimension of Microcalcifications grown in simulated tissue determines metastatic.

## Experience

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- **Executive Board Leadership of OSU Cycling Team** OSU  
*Secretary, President, Vice President and Social Media Chair*
  - **Informed:** members of club activities and requirements with presentations and emails.
  - **Directed:** during the pandemic. I was able to quickly change plans to keep members engaged.
- **Graduate TA - Mathematics & Biology Training** OSU  
*Introductory Calculus and Biology Instructor*
  - **Lead:** calculus recitation sections. Responsible for test development, grading, and teaching.
  - **Managed:** biology laboratory sections. Responsible for planning lessons, grading lab reports and exams.

## Presentations / Publications

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- **Presentations:** SMB invited speaker 2023, IGP Seminar 2022 (15 minute talk) & 2021 (poster)
- **1st Author:** [Pollen model in PLOS-ONE](#); [Tumor model in Comput Biol Med](#) in top 2016 articles.

## Education

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- **The Ohio State University** Columbus, Ohio  
*Ph.D. - Molecular, Cellular, Developmental Biology* Expected Graduation: Aug 2023  
*M.M.S. - Mathematical Biosciences*
- **The University of Maine** Orono, Maine  
*B.A. - Mathematics minor Computer Science* 2015