



UNC  
GREENSBORO

Department of  
Computer Science

## Department of Computer Science

### Colloquium Series

#### Scalability and Natural Computing in Artificial Morphogenesis



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Department of Computer Science  
UNC Greensboro**

**Date:** Wednesday, October 5<sup>th</sup>, 2022

**Time:** 11:00am-12:00pm

**Location:** Petty Science Building 219

#### Abstract:

What could we create with millions of tiny, simple robots? In biological development, millions of cells self-organize to create useful, complex structures that are scalable and robust. Artificial morphogenesis seeks to harness these properties in designed structures. Current research is mostly simulated, but future applications could include medical devices, self-constructing buildings, or neuromorphic processors.

My own research emphasizes scalability by compiling descriptions of swarms in the continuum limit, as infinite collections of infinitesimally-sized agents. I also address communication challenges by offloading key computations to the physical environment, taking biological cells' use of chemical morphogens as inspiration.

#### Biography:

Dr. Allen McBride is a Visiting Assistant Professor in the Department of Computer Science at UNCG. He earned his Ph.D. in May from the University of Tennessee in Knoxville, under Dr. Bruce MacLennan. He was previously a postgraduate researcher at Oak Ridge National Laboratory, where he studied forest ecology, climate change, and sustainable bioenergy.