# PROJECT SUMMARY

## Overview:

CUE: Collaborative Research: Effective Peer Teaching Across Computing Pathways

Sarah Heckman, Lina Battestilli, Anna Howard - NC State University
Kristy Boyer, Maya Israel - University of Florida
Ketan Mayer-Patel, David Gotz - University of North Carolina - Chapel Hill
Kristin Stephens-Martinez, Karen Murphy - Duke University

**Problem.** Undergraduate computing programs are seeing significant increases in demand to provide computing courses that prepare diverse, interdisciplinary students for careers that involve computer science. Providing scalable, high-quality support for students across computing pathways presents a critical challenge. The proposed project will advance the state of knowledge and practice around recruiting and preparing undergraduate near-peers as Peer Teaching Fellows (PTFs) to scale student support across computing pathways.

**Context.** The proposed project will expand an existing PTF Networked Improvement Community (NIC) of computer science faculty at NC State University, University of Florida, University of North Carolina Chapel Hill, and Duke University to include colleagues from partner departments across STEM disciplines. The team's prior Google-funded work led to a software environment to monitor in-person office hour interactions, an analysis of online discussion forums, PTF development, and hosting the first Peer Teaching Summit co-located with SIGCSE 2019. The vision of the PTF NIC is to create a community of researchers and practitioners who advance the state of knowledge and practice on recruiting and preparing PTFs to support diverse students across a spectrum of computing pathways to develop skills critical to independence and self-efficacy. A critical skill raised at the Peer Teaching Summit is student debugging practice.

**Goals.** We will build a PTF NIC with the common goals to: 1) identify and support student help-seeking patterns across computing pathways by a) investigating the ways in which diverse students seek help in-person or online and b) increasing the effectiveness of help-seeking interactions that focus on debugging; 2) create Peer Teacher development materials that support effective debugging help-seeking interactions; and 3) disseminate development materials and other findings through the 2nd Peer Teaching Summit and other venues.

**Activities and Methodology.** We will utilize and refine existing data collection frameworks to gather data through office hours and discussion forums. Meeting regularly to discuss the data and develop common metrics and approaches, we will come to better understand how and why interdisciplinary students seek help and how students approach debugging activities. Our common goal is to design interventions to support debugging help-seeking interactions through PTF Development. Monthly team meetings and a three-member advisory board will help us meet our goals.

## Intellectual Merit:

We are advancing knowledge through an empirical investigation of student help-seeking patterns and identifying ways to develop student debugging skills during interactions with PTFs. We are advancing instruction by providing resources to educators about best practices and PTF development to support student debugging skills through help-seeking interactions and expanding the PTF NIC with the 2nd Peer Teaching Summit.

## Broader Impacts:

We will broaden participation and improve STEM education by recruiting PTFs from underrepresented groups, training them to support diverse students across computing pathways, and increasing the quality and effectiveness of student support in a highly scalable way. Tools and PTF development resources discussed at the 2nd Peer Teaching Summit and other venues will enhance educational infrastructure.