Abstract: The pervasive impacts of technology on our everyday interactions, culture, society, and economy demands that an educated populace understand underlying computer science concepts and techniques. However, recent projections indicate that by 2020 there will be 1 million more jobs than computing graduates. The approach taken by the Engaged Learning Lab to solve this problem is to design, build, and study technology-rich learning environments that help students learn computer science content and reasoning in the context of personally-interesting activities. Further, in order to engage a broader range of students, both informal (e.g., after-school programs, summer camps, and competitions) and formal learning environments are utilized. This presentation will discuss how physical computing and the design of computational artifacts have been in these contexts in order integrate computer science into the lives of K-16 students. Future directions and approaches for addressing the underproduction of computationally-savvy students will be discussed.

Bio Sketch: Dr. Christina Gardner-McCune is an Assistant Professor in the School of Computing, Human-Centered Computing Division at Clemson University. Her research focuses on studying how people learn and apply computing in after-school, k-12 classrooms. Her research approach involves the iterative design, refinement, and sustainability of curriculum, teacher professional development, and program development to support and study learning in formal and informal learning environments. She is currently serving on the College Board’s Advanced Placement Computer Science Principles Exam Development Committee.

She holds a B. S. degree in Computer Engineering from Syracuse University, and earned both her masters and doctorate in Computer Science from Georgia Institute of Technology with specializations in Software Engineering and Learning Sciences and Technology. She is also a board member of Y-STEM (Youth Science, Technology, Engineering, and Mathematics organization), a non-profit foundation focused on enhancing the quality and accessibility of formal and informal STEM learning opportunities to African American and disadvantaged youth.