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Popcorn Linux: System Software for Emerging Heterogeneous Platforms
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Abstract: Due to the imminent demise of Moore's Law, systems designers ranging from smartphone chipmakers to cloud providers have increasingly relied on heterogeneous architectures to continue scaling performance. However, coupling new architectures together has forced developers to manually manage increasingly complex systems. Not only does this require significant developer effort to understand and utilize these new architectures, but it can also lead to sub-optimal application execution in the face of dynamically changing workloads. The Popcorn Linux project aims to bring sanity back to developers – using a new compiler, operating system and runtime, Popcorn Linux allows developers to write compiled C/C++ shared memory applications and transparently leverage the scalability and heterogeneity of emerging systems. In this talk, I will describe how Popcorn Linux allows applications to transparently migrate between physically distinct, heterogeneous-ISA CPUs. Additionally, I will describe the benefits of migration from a system management perspective, including performance, energy efficiency and security advantages.

Biography: Rob Lyerly is a Ph.D. candidate in the Bradley Department of Electrical and Computer Engineering at Virginia Tech. He is a member of the Systems Software Research Group and is advised by Dr. Binoy Ravindran, where he studies operating systems, compilers and runtimes for emerging computer architectures. He is a former Bradley Fellow of the department and won the ACM Student Research Competition co-located with PLDI 2017. He has a B.S. in both Computer Science and Computer Engineering and an M.S. in Computer Engineering, all from Virginia Tech.