

SUMMARY OF  
PROGRAMMING LANGUAGES, COMPILER,  
RUNTIME SYSTEMS BREAK-OUT SESSION



# ADDRESS COMMON PROBLEMS WITH COMMON SOLUTIONS

- New exciting application areas
  - mobile, wearable, VR ... (edge computing)
  - heterogeneous devices/systems
- Mature research areas
  - common expressions (programming languages)
  - common optimization (compilers)
  - common run-time principles (e.g. scheduling)

# PROGRAMMING RESEARCH

- Vibrant and expanding
  - OpenMP, MPI, PGAS, GPU, Swift, Go, RUST ... LLVM
- Users and programmers care about
  - parallelism, locality, power, resource management
  - approximation/adaptation/resilience/reliability/location
  - response time/tail latency

# PROGRAMMABILITY RESEARCH

- PL/AI symbiosis
  - PL, compilers, run-time systems
  - AI, deep learning, graph analytics
- Support for profiling/optimization, e.g. OpenMP tool interface (OMPT)
- Resource oblivious programming
- MPI + X, Safe parallelism, Streaming and DSL