27 March 2026

CHERI-PIT: Port Integrity Tool

Automatically Porting C/C++ Applications to CHERI

This material is based upon work supported by DARPA and NIWC PAC under Contract No. N66001-25-C-4001.

Any opinions, findings and conclusions or recommendations expressed in this material are those of the author(s) and do not necessarily reflect the views of DARPA and NIWC PAC.

Dr. David Musliner
Senior Research Fellow
Smart Information Flow Technologies (SIFT)

SIFT
Smart Information Flow Technologies

Trusted-ST

CAPABILITIES LIMITED

CHERI-PIT: Automatically Porting C/C++ Applications

- Goal: dramatically reduce the barrier to entry for CHERI systems. 80+% solution desired. Secondary goal: make SIFT & TST your go-to resources for US-based CHERI expertise.
- Vision: 100% solution: **no manual changes to original source code**.
- Approach: CHERI-PIT1: Custom pipeline using LLMs in controlled fashion. 36 small porting examples used as context. Available at https://github.com/CTSRD-CHERI/cheri-c-examples .
- CHERI-PIT2: multi-agentic code-aware approach (Claude-code++), more successful at cross-file changes, but not yet as reliable: “like an optimistic intern that lies.”
- Results: 80-100% porting success on large applications including Ardupilot, nginx, sqlite3, postgres, Apache httpd & apr, PHP, cpython, lz4, Lua, NASA CFS. Thousands of compiler warnings reduced to dozens or zero, in minutes to hours, at near-zero LLM cost.
- Invitation: if you want to try it out, let me know!