# Computer System on FPGA

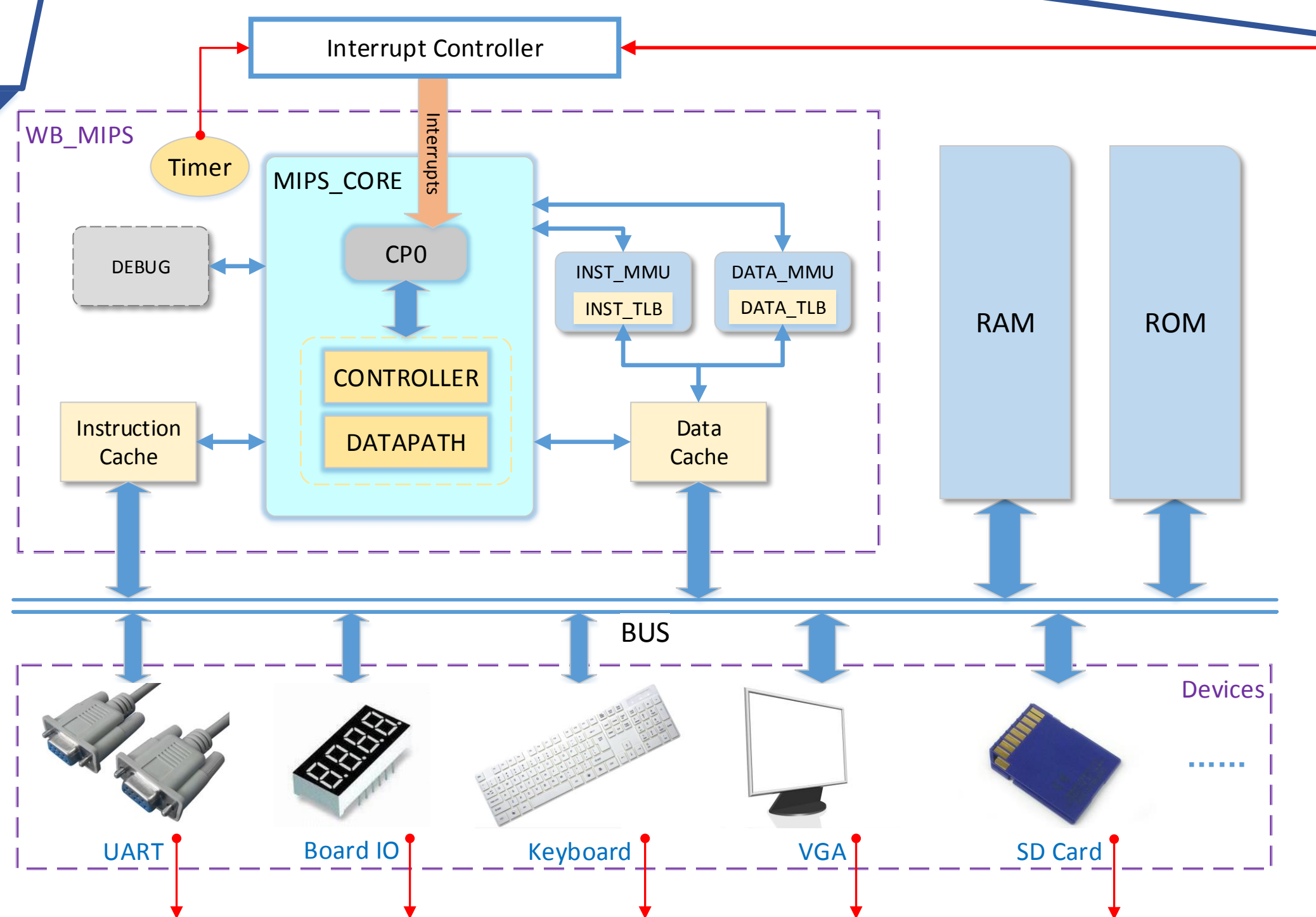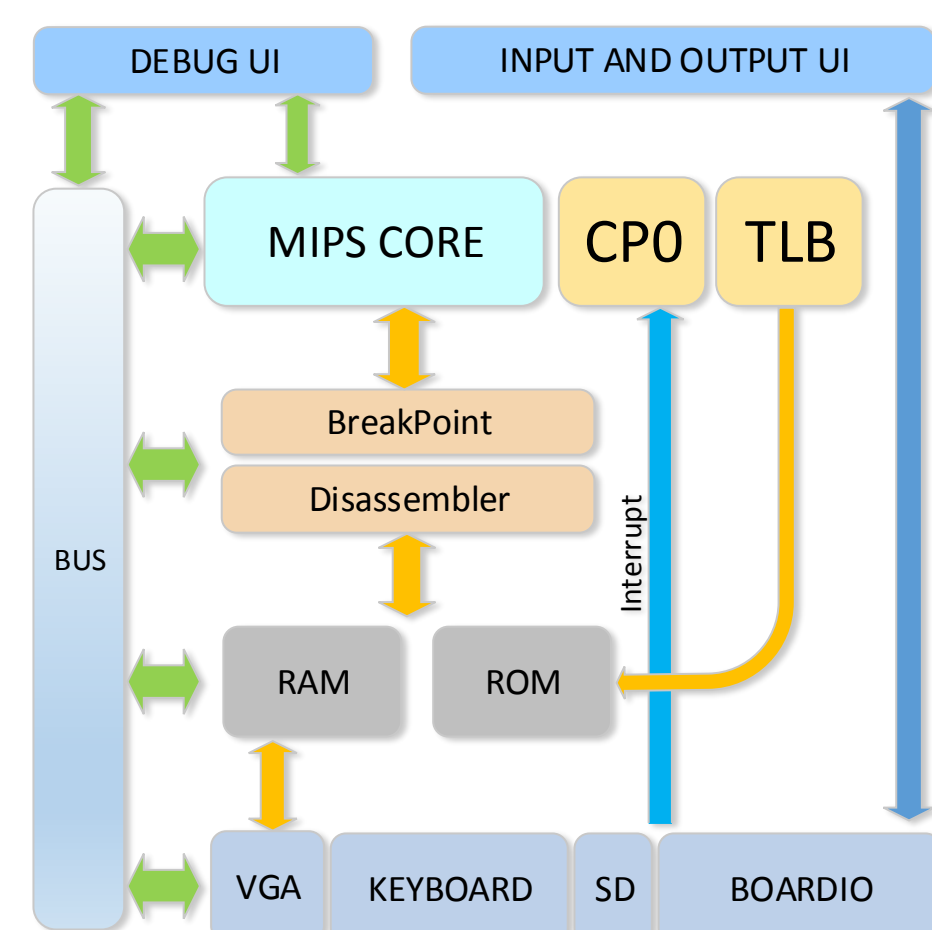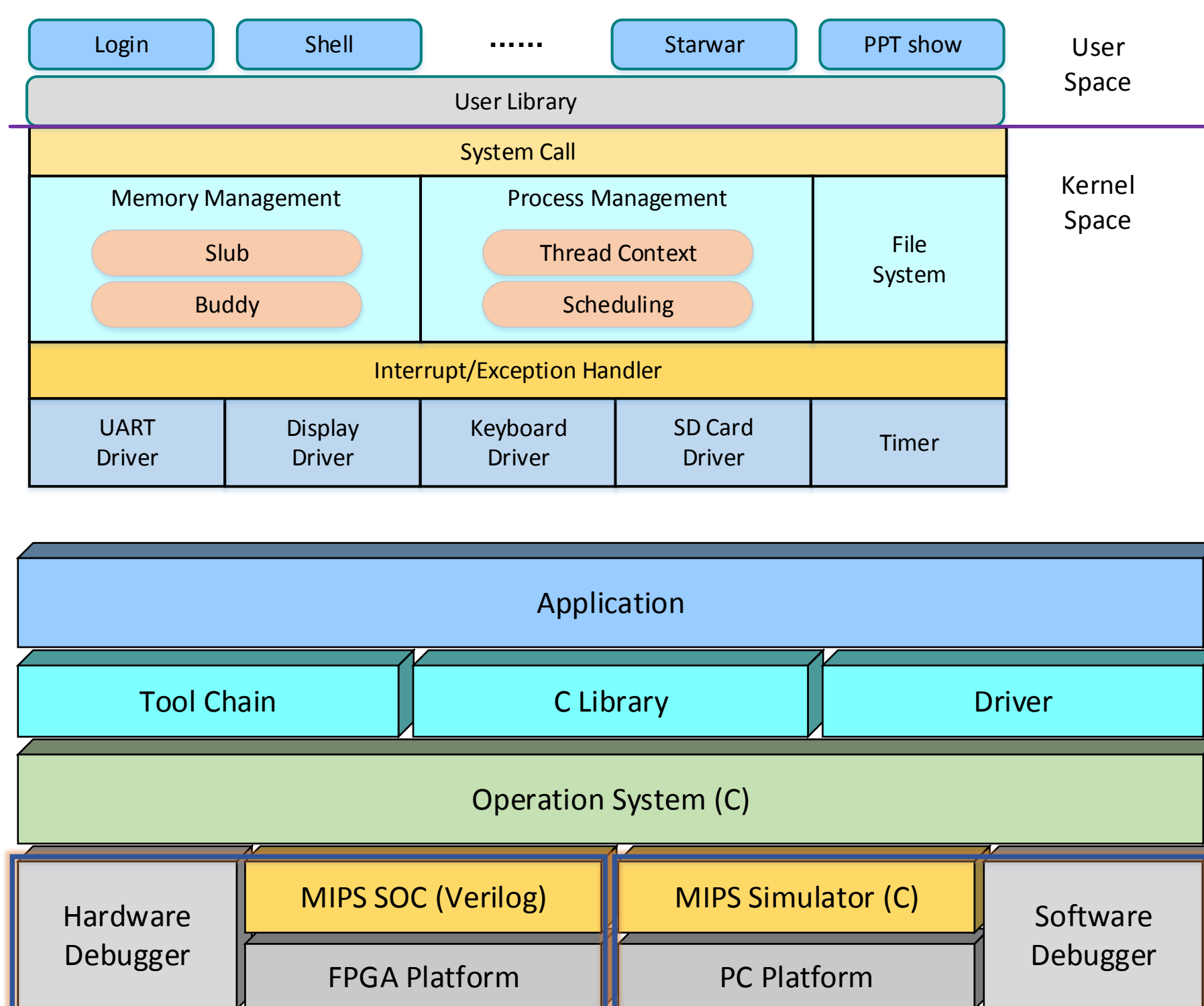## Zhao Hongyu, Long Peng, Ni Junyang @ZJU

A real computer is consisted of many important parts, CPU, MEM, OS, APP, etc. To have a wide and deep aspect on the whole computer system, we are trying to build our own computer from scratch, including both hardware and software. From then on we can have a better point to start the architecture research, as we can change almost everything we can, to make the computer system smaller, faster, and more intelligent.

This project, "Computer System on FPGA", is just a standard version of computer system, actually we can also build a system oriented on specific purpose, such as embedded system, real-time system, or even large-scaled computing system.

**Three Main Components:**
- Hardware (Buttom)
  System-on-chip design using Verilog
- Software (Up Left)
  Linux-like operating system and library
- Simulator (Middle Right)
  Hardware simulator designed by Java



- 5-stage MIPS CPU
  with 53 instructions
- MMU Support
  2-level paging
- Cache Support
  separated I/D Cache
- Wishbone Bus
  in burst mode
- Interrupt Support
  by optimized CP0
- Address Mapping
  RAM/ROM/IO