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1 Plan

This document describes about the upcoming PhD plan for the upcoming year with the reflection of the previous year.

1.1 Link to Previous PhD plan:

`https://github.com/Akilan1999/phd-thesis/releases/download/Year2/thesis.pdf`

1.2 Highoverview of the previous plan:

1.2.1 Phase 1: FAT-Pointer (JulSep 2024)

1. July 115 (2024)
   - Debug L1 TLB misses
   - Run COZ benchmarks
   - Port kernel module to SnMalloc
2. July 1530 (2024)
   - Benchmark with SPEC & XSBench

- Compare with SnMalloc variants

3. August (2024)
   - Draft EuroSys paper
4. September (2024)
   - Write thesis chapter
   - Finalize EuroSys submission

1.2.2 Phase 2: RISC-V Integration (Oct 2024May 2025)

1. OctoberDecember (2024)
   - Modify Bluespec to bypass TLB
   - Set up evaluation environment
2. JanuraryFeburary
   - Evaluate FAT-Pointer on RISC-V
   - Draft and refine ISMM paper
3. MarchMay
   - Address backlog
   - Extend thesis chapter

1.2.3 Phase 3: Uni-Kernel (May 2025September 2026)

1. MayDecember 2025
   - Port allocator to CHERI Uni-Kernel
   - Design and evaluate unified allocator
   - Draft OSDI paper
2. JanurarySeptember 2026
   - Finalize full PhD thesis

1.3 Current plan

1.3.1 June to July (2025)

- Working on modifications to BlueSpec BSV files of the CHERI Toooba architecture.
- Setting up baremetal C benchmark against the BlueSpec simulator.
- Supervisory team modifications to the EuroSys paper.
- Progression month.
- Send the EuroSys paper to the Glasgow CHERI team for feedback.

1.3.2 July to August (2025)

- Heavy debugging of the Toooba core for potencial expected errors (Bypass TLB phase of the memory pipeline).
- Finalising the C benchmark suite for the Toooba architecture.
- Documenting Toooba work to reused for the 2nd paper.
- End of July (Work on EuroSys paper).

1.3.3 August to September (2025)

- Heavy debugging of the Toooba core for potencial expected errors (Similar to July).
- Finish writing for Toooba work the Abtract, Introduction and methodology of the paper.
- Expect preliminary results of the Toooba expirment.

1.3.4 September to October (2025)

- Publish EuroSys paper (FAT Allocator).
- Start benchmarking Toooba work.
- Parallel write up of the Evaluation section.

1.3.5 October to November (2025)

- Start work on the 3rd expirement (Heavier evaluation of expirement 1 and 2).
- Modification to replace mmap in TcMalloc and Mesh allocator

1.3.6 November to December (2025)

- Strip away Huge page aware implementation from JeMalloc, TcMalloc and Mesh.
- Analyse the amount intructions reduced.
- Start writing paper 3 based on EuroSys paper.

1.3.7 December to Janurary (2025 to 2026)

- Evaluation of paper 3.
- Start writing thesis for Expirement 1 and 2.

1.3.8 Janurary to September (2026)

- Backlog catch up.
- Paper publishing for Expirement 3.
- Thesis write up phase.