

ICE3028: Embedded Systems Design

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Embedded Software Laboratory

Sungkyunkwan University

<http://nyx.skku.ac.kr/>

Introduction

- Schedule
 - 13:30 – 14:45 (Tuesday), 12:00 – 13:15 (Thursday)
 - Lecture room #400126, Semiconductor Bldg.
 - PC room #400202, Semiconductor Bldg.
- Course homepage
 - http://nyx.skku.ac.kr/?page_id=2303
 - Lecture slides, announcements, exam scores, projects, ...

About me

- Dongkun Shin (신동군)
 - Professor @ SSE & SW Dept.
 - Embedded Software Laboratory
 - Embedded systems, Operating systems, Storage systems, Computer Architecture, On-Device Machine Learning, ...
 - Email: dongkun@skku.edu
 - Office: Semiconductor Bldg., #400310
 - Office hours: 15:00~17:30 (Wed)
 - Email contact is preferred

TAs

- We have two awesome TAs
 - **Junho Lee** (이준호)
 - crow6316 at gmail.com
 - **Somm Kim** (김 솜)
 - sommkim at skku.edu
 - Office: #400309, Semiconductor bldg.
- They will lead your lab sessions and assist your projects

Course Plan

- Lectures
- Projects
- Exam

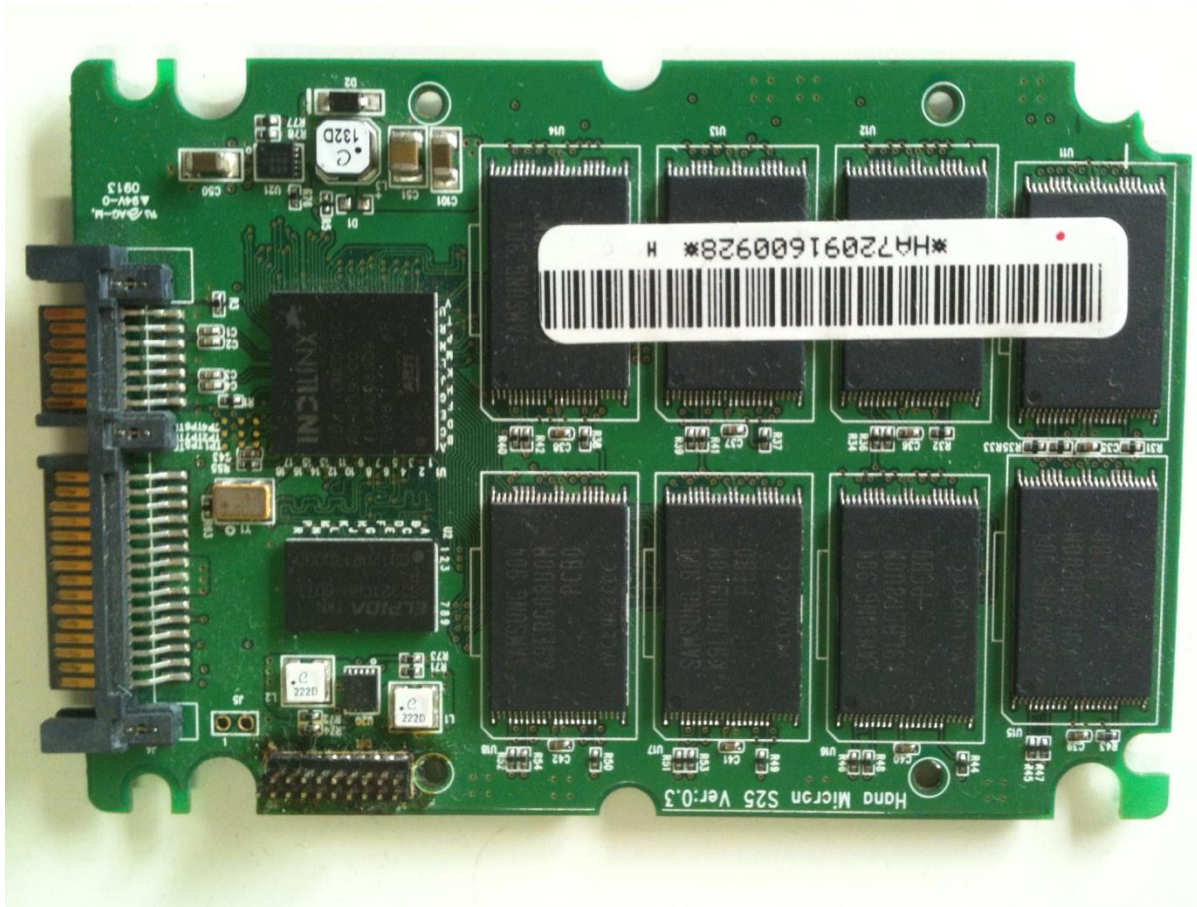
Lectures

- **Brief Introduction to Embedded Systems**
- **Issues surrounding SSDs**
 - NAND flash memory,
 - FTLs
 - SSD Technologies
 - File Systems
- **Lab sessions**
 - Jasmine OpenSSD platform

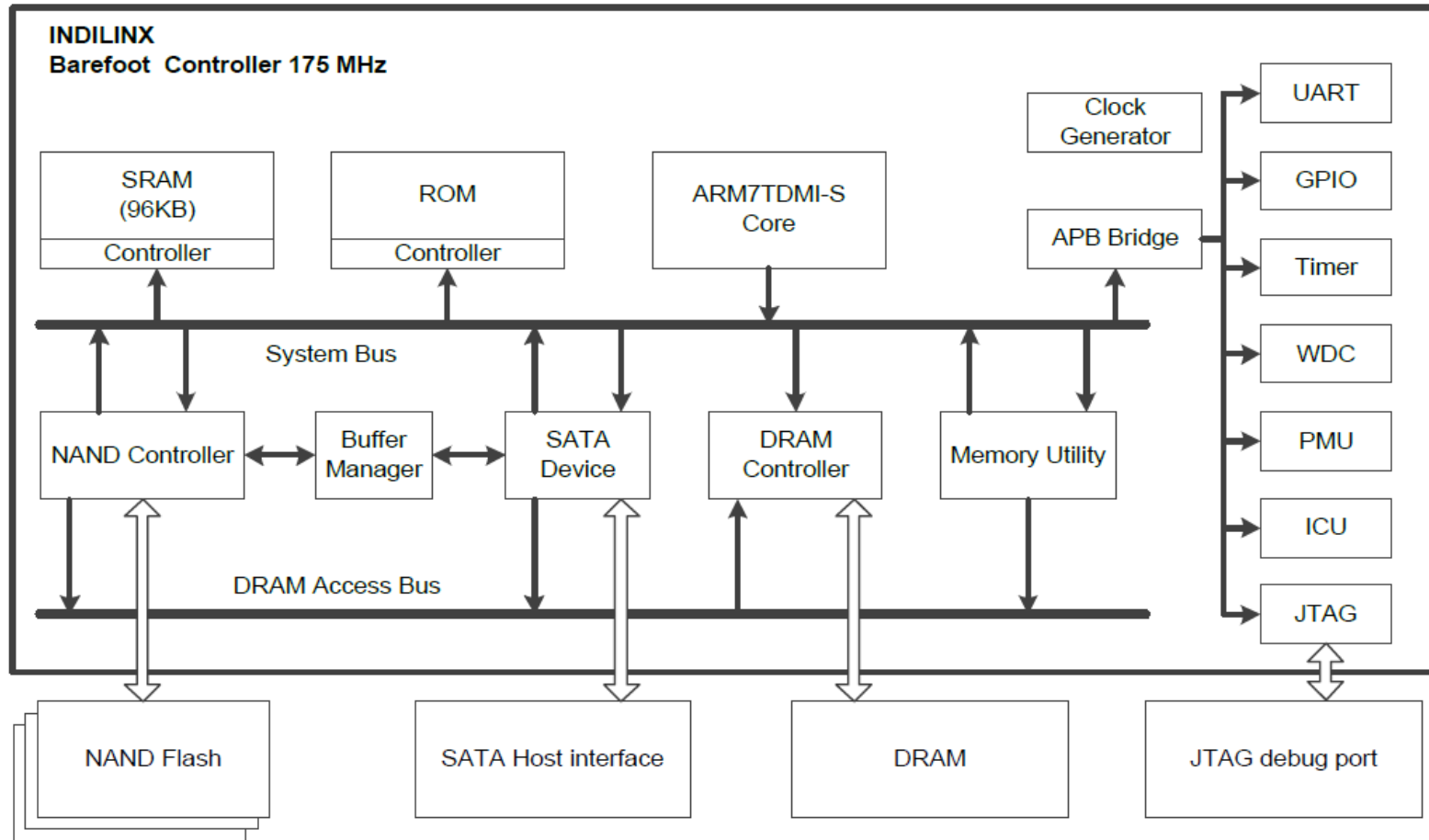
Projects

- There will be weekly assignments and two main projects using the Jasmine OpenSSD platform
- These are team projects
- You'll need a Linux-based PC for projects
- Most of Thursday classes will be devoted to Lab sessions led by the TA

Solid State Drive (SSD)

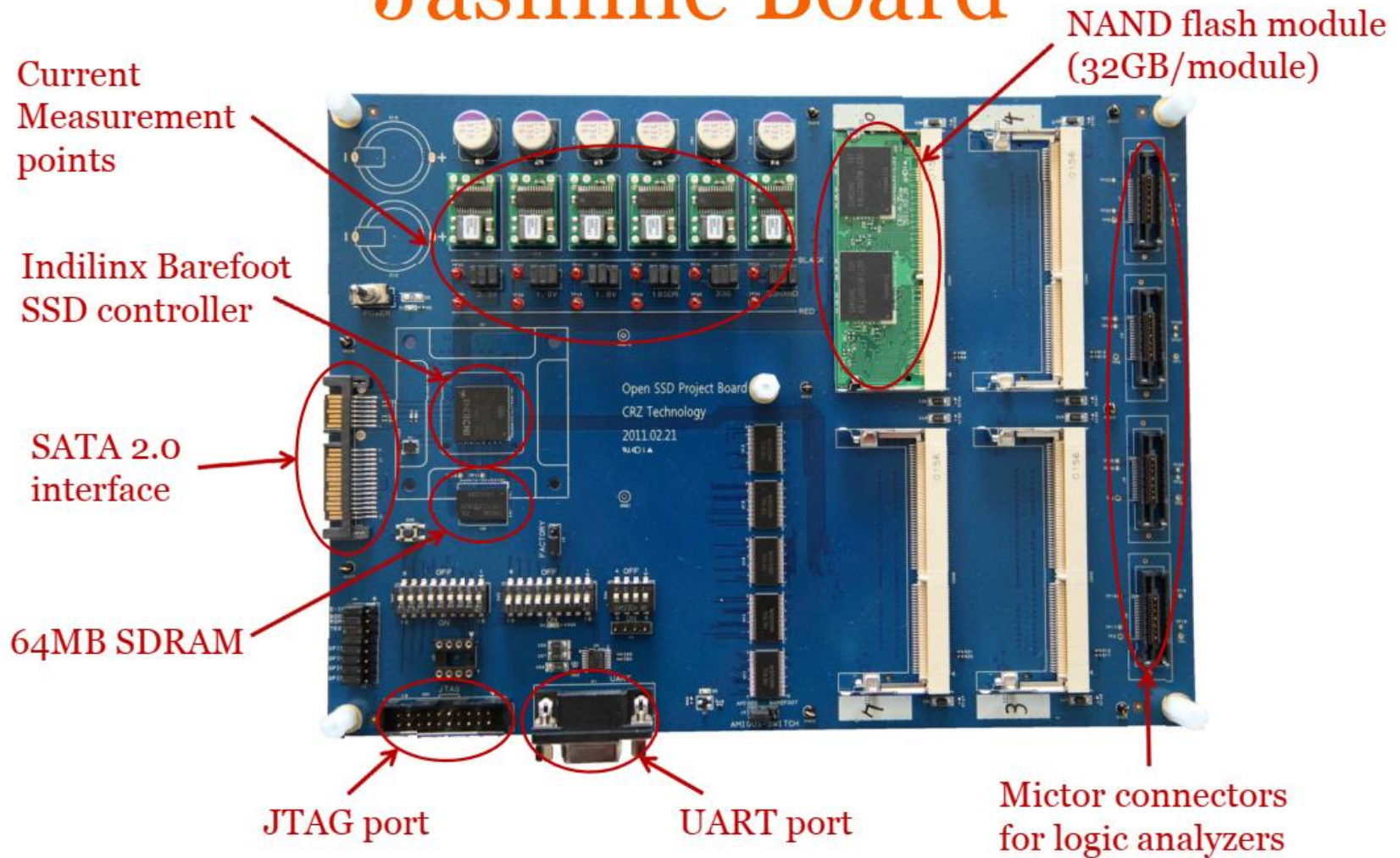


SSD Internals



Jasmine Board

Jasmine Board



Exam

- No midterm exam
- We will have only the final exam at the end of this semester.

Prerequisites

- **ICE3003: Computer Architecture (Must!)**
- SSE2030: Introduction to Computer Systems
- SSE3044: Operating Systems

- You should be fluent in C programming!

Schedule

week	Tuesday	Thursday	Assignments
1	Course Overview	Intro to embedded systems	
2	NAND Flash Memory I	(Holiday)	
3	NAND Flash Memory II	Jasmine board Setting	
4	FTL I	Dummy FTL	NAND (Sim)
5	Tutorial FTL	(Holiday)	Page mapping Greedy/C-B GC FTL (Sim)
6	FTL II	Greedy FTL	RAM FTL (Jasmine)
7	No Lecture	FTL Testing (Jasmine)	
8	FTL III		
9	SSD Technologies I - OC-SSD, MS-SSD	DFTL	DFTL (Sim)
10	SSD Technologies II - KV-SSD, ISP	Multi-Streamed SSD	Multi-Stream (Sim)
11	New Memory Technologies	Jasmine Porting Guide	DFTL (Jasmine)
12	File Systems I	F2FS	
13	File Systems II	DFTL Optimization Method	DFTL Project (Jasmine)
14	Reserved	Project Q&A	
15	Project Presentation I	Project Presentation II	
16	Final Exam		

Grading Policy

- Class attendance + Lab: 20%
- Projects: 60%
- Final exam: 20%
- Grading policy is subject to change.

- If you miss the final exam, you will fail this course.