Why are we here?

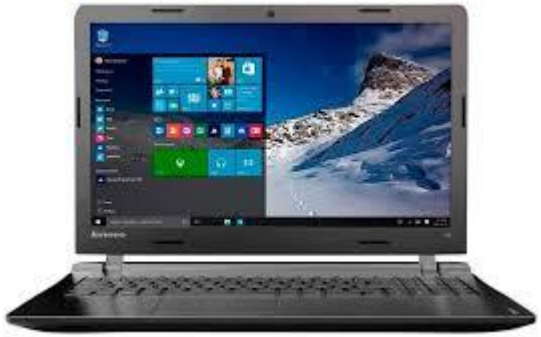
- Why memory?
- Why device?
- What could we get out of this?

"640k ought to be enough for anybody."

Bill Gates, 1981

Data center

Smart phone



Laptop

ECE 2263: Emerging Memory Technology

- Emerging Memory Technology: From Devices to Applications
- Lectures: Wednesdays 6:00 – 8:30 pm
- Location: G29 Benedum Hall
- Instructor: Prof. Feng Xiong, 1202 BEH, f.xiong@pitt.edu
- OHs: Wednesdays 5-6 pm, and by appointments
- Syllabus, course materials and announcement will be posted on CourseWeb

Grading Criteria

- Class participation 10%
  - participating in discussion and Q&A for presentations
- Term paper presentation 20%
  - 5% from peer review
- Term paper report 20%
- Final project presentation 20%
  - 5% from peer review
- Final project report 30%
  - 5% from peer review by teammates

Term Paper (Individual)

- **Literature review** on a relevant emerging memory technology topics
- Discuss potential topics with the instructor
- Oral presentations (15 mins)
  - You may sign up for a slot (will be emailed out later) after you finalize your topic with the instructor
  - Finalize your topic by **Feb 5th**
- Written report (4-page IEEE-style paper) due on **Feb 26th**
- Format
  - Introduction, problem statement, existing approaches, future directions, summary

Final Project

- Team project: ~5 people per team
- Proposing a 3-year memory research effort
  - Discuss your topic with the instructor
  - Finalize your team and topic by **March 4th**
  - Team report due **April 15th**
- Oral presentations
  - ~20 minutes, **April 15th**
  - everyone needs to present
- National Science Foundation (NSF) 15-page report style
  - Overview
  - Expected significance
  - Background and current SoA
  - Proposed research
  - Broader impact

Final Report – Overview

- Problem statement
  - Attention grabbing opening – why is this important?
  - Current knowledge
  - Unmet need and/or gap in knowledge
  - Challenge because of this unmet need/gap in knowledge
- Objective
  - Long term goal
  - Overall hypothesis and how this is formulated
  - Rationale – why we want to do this
- Specific aims
- Payoff
  - Why is this transformative/original
  - Expected outcomes – should correspond to your specific aims
  - Expected significance

Final Report – Proposed Research

- Specific aims
  - Rationale – unmet need and/or gap in knowledge
  - Clear end objective
  - Hypothesis with supporting theory
  - Technical approach
  - Analysis of data
  - Expected outcome
- Timeline with deliverables
- Summary

Course Schedule

Course Schedule for Spring 2020 ECE 2263 Emerging Memory			
Week	**Date**	**Topic**	**Notes**
1	W 1/8	Syllabus and Requirement	
2	W 1/15	Introduction to Memory I	
3	W 1/22	**Instructor traveling NO class**	
4	W 1/29	Introduction to Memory II	
5	W 2/5	PCM: Scaling and Opportunities	Term topic due
6	W 2/12	RRAM I: Scaling and Opportunities	
7	W 2/19	Term Paper Presentations	
8	W 2/26	Term Paper Presentations	Term paper due
9	W 3/4	**Instructor traveling NO class**	Team topic due
10	W 3/11	**Spring break NO class**	
11	W 3/18	RRAM II: Scaling and Opportunities	
12	W 3/25	Intro to Neuromorphic Computing	
13	W 4/1	Synaptic Device: PCM	
14	W 4/8	Synaptic Device: RRAM	
15	W 4/15	Final Project Presentation	Final report due