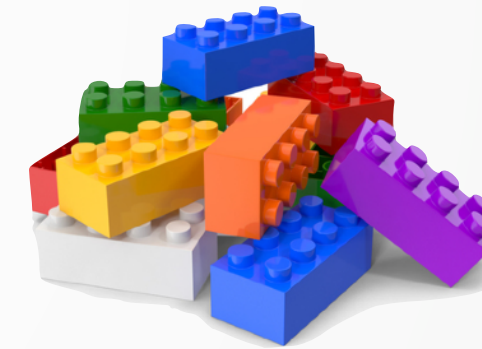


Advanced Course

Distributed Systems

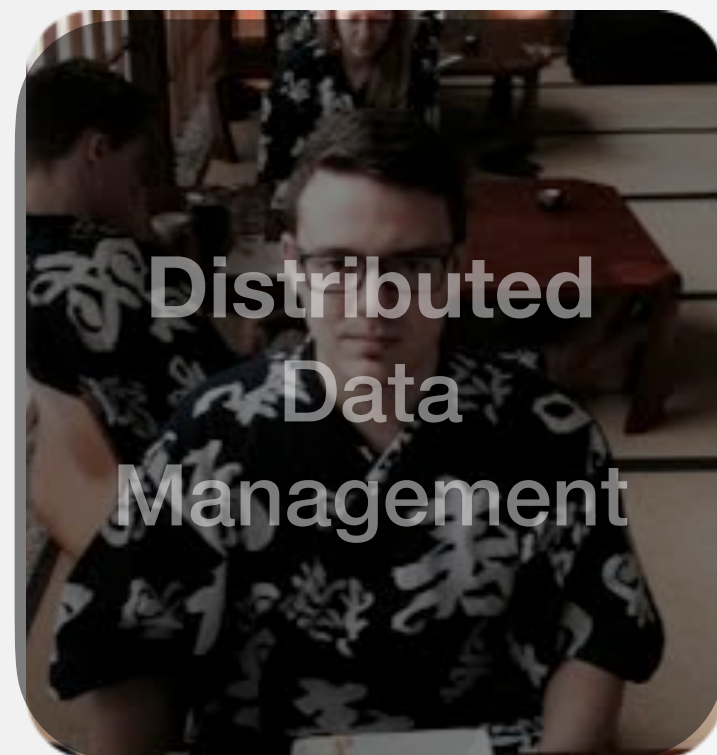
Course Introduction



Paris Carbone

PEOPLE

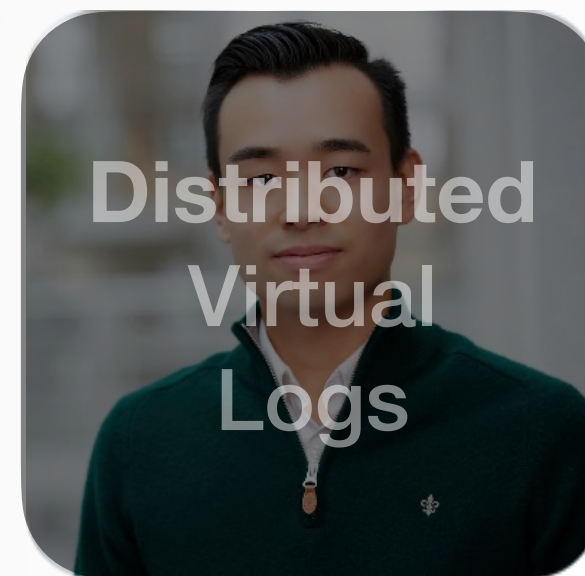
Teachers



**Paris
Carbone**
(examiner)



TAs



**Harald
Ng**

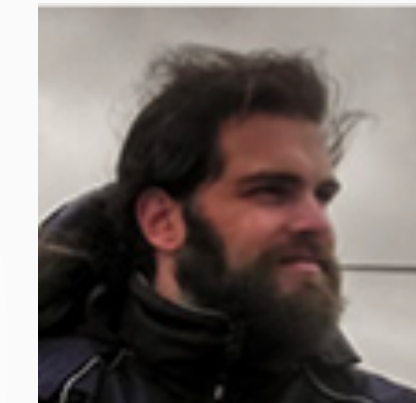


**Sonia
Horchidan**



**Max
Meldrum**

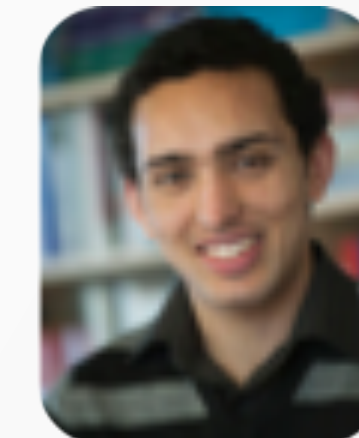
Alumni - Hall of Fame



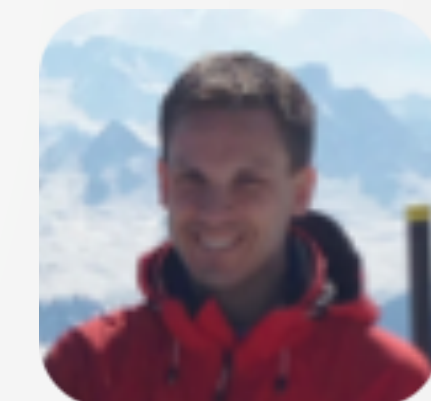
**Lars
Kroll**



**Cosmin
Arad**



**Tallat
Shafaat**



**Niklas
Ekström**



**Seif
Haridi**
(previous teacher)



**Ali
Ghodsi**

cloud ID2203



KTH-2023

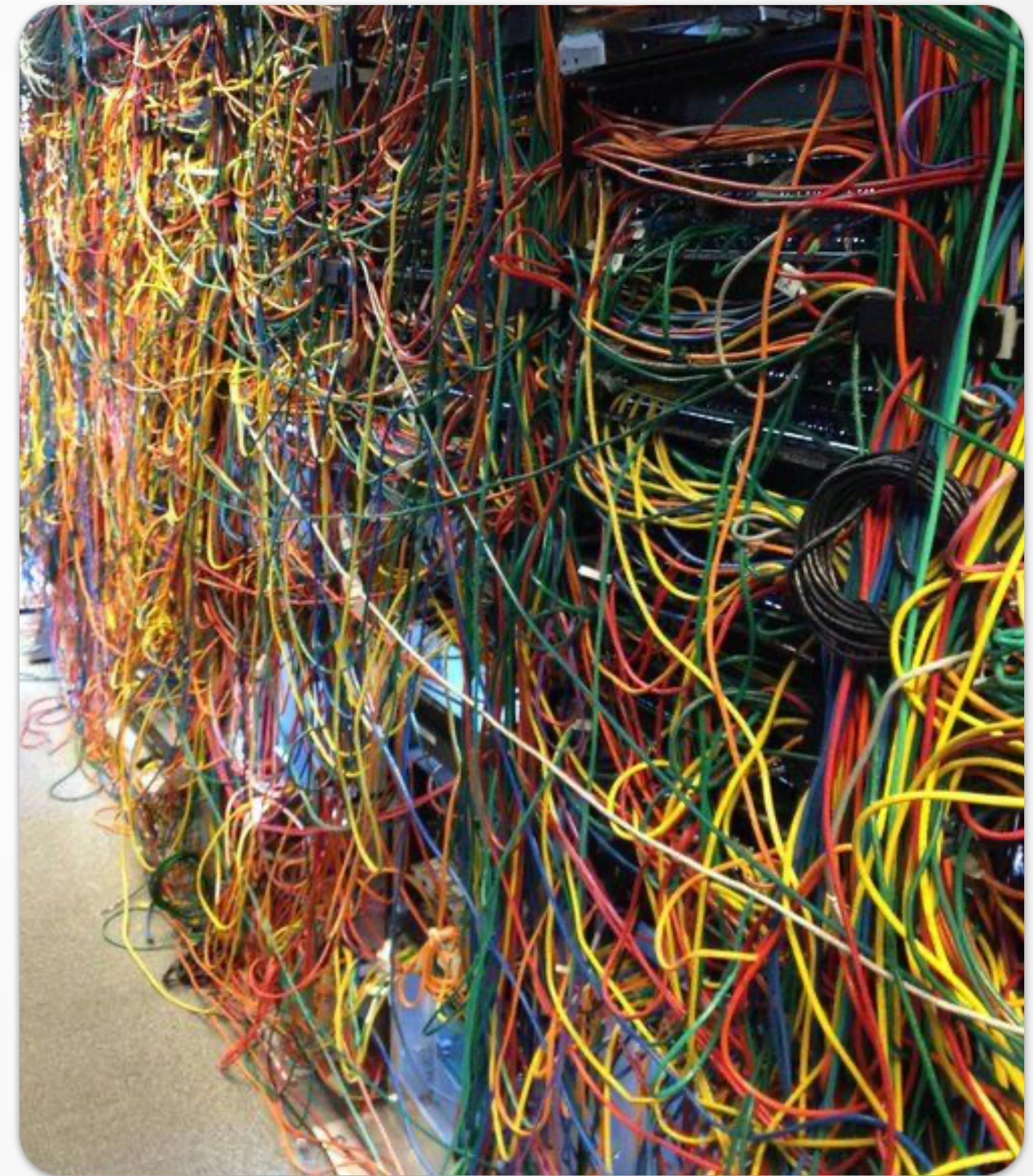
KEY APPLICATIONS

- ▶ Distributed Data Systems
- ▶ Cloud Computing
- ▶ Edge Computing
- ▶ Data Management

WAY OF THINKING



VS



COURSE TOPICS



- ▶ Intro to Distributed Systems
 - ▶ Fundamental Abstractions and Failure Detectors
 - ▶ Reliable and Causal Order Broadcast
 - ▶ Distributed Shared Memory-CRDTs
 - ▶ Consensus (Paxos)
 - ▶ Replicated State Machines (OmniPaxos, Raft, Zab etc.)
 - ▶ Time Abstractions and Interval Clocks (Spanner etc.)
 - ▶ Consistent Snapshotting (Stream Data Management)
 - ▶ Distributed ACID Transactions (Cloud DBs)
- ▶ Basic Components
- ▶ Advanced Systems

COURSE CONTENT

Canvas - <https://canvas.kth.se/courses/37639>

- ▶ Recorded Lectures
- ▶ Textbook & Algorithms
- ▶ Quizzes
- ▶ Labs & Tutorials
- ▶ Course Forum (Piazza)
- ▶ Assignments & Project
- ▶ Final Exam

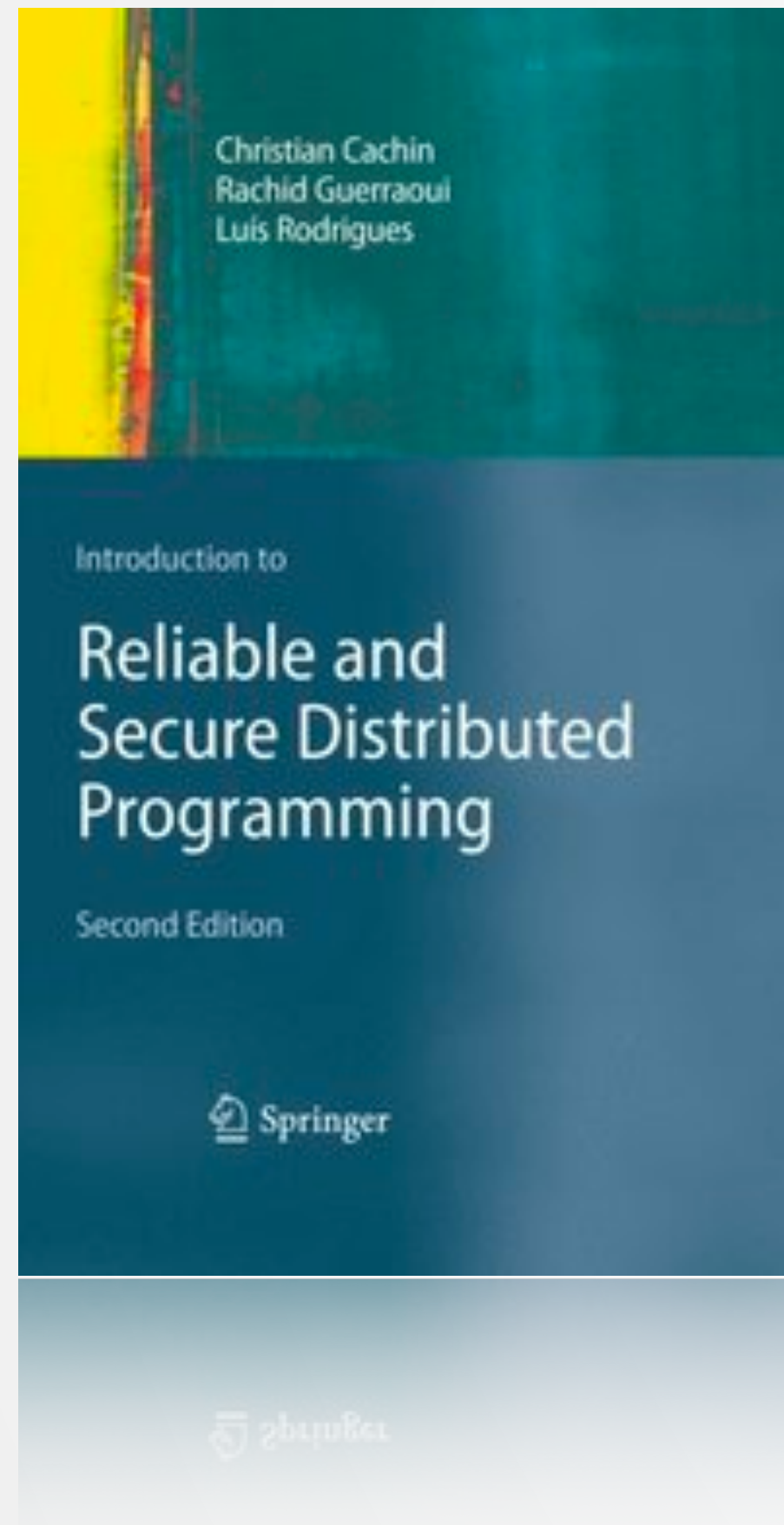
LECTURES

- ▶ **Hybrid** Lecture Mode (Sal-C / Zoom)
- ▶ Physical participation : optional but recommended
- ▶ Recorded Videos : uploaded in Canvas under Modules

TEXTBOOK

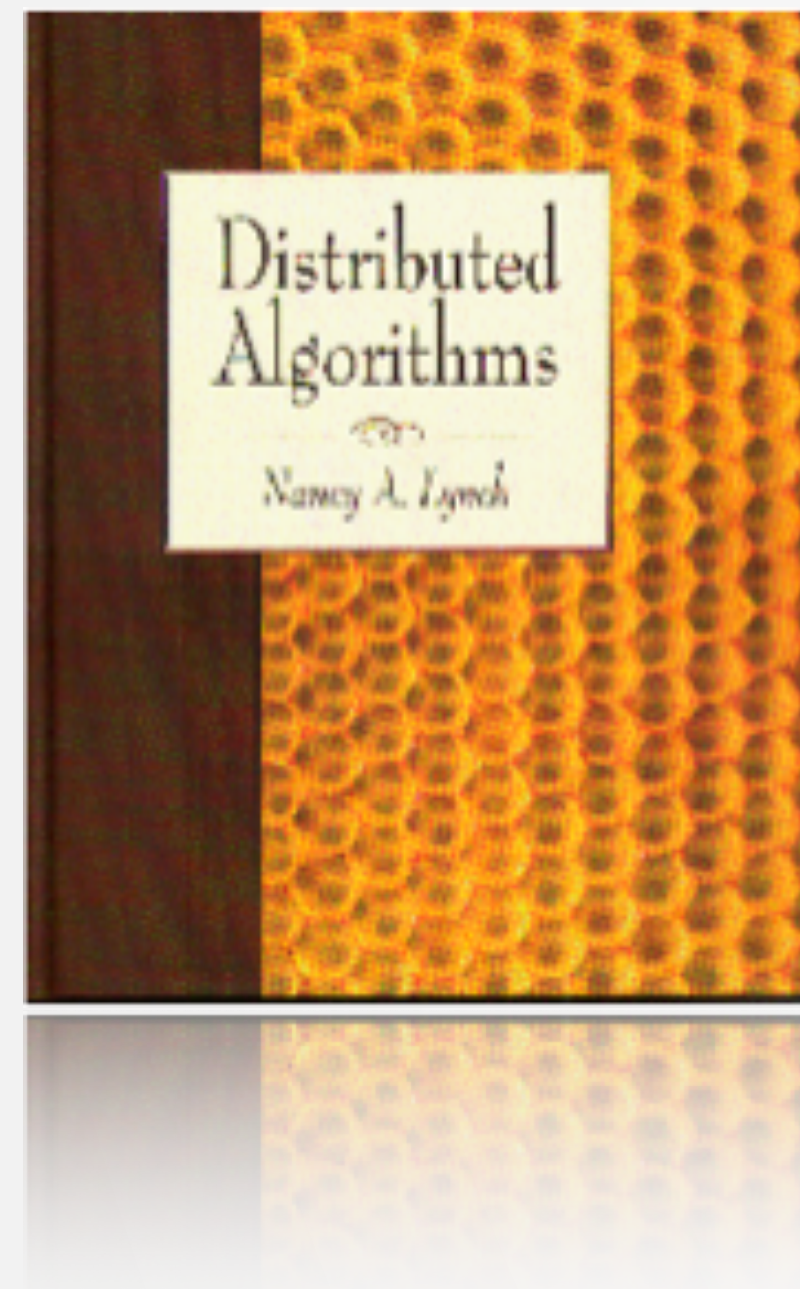
“Reliable and Secure Distributed Programming”

Cachin, Guerraoui, Rodrigues



- Main textbook of the course
- Covers most of the content presented
- Complements lectures but doesn't replace them
- E-book available at KTH Library & Canvas

TEXTBOOK



“Distributed Algorithms” by Nancy Lynch

- Another Recommended Reading
- Covers Input-Output Automata

QUIZZES

1. Non-Graded

- Complement each lecture
- Crucial for assessing understanding

2. Graded

- Graded after each module
- **13P** of the final grade

PIAZZA FORUM

- <https://piazza.com/kth.se/spring2023/id22032023/home>
- Questions & Discussions
- Anonymous posting
- All registered students will be automatically added
- Notify us if you cannot access it

LABS & TUTORIALS

- Live Zoom Sessions with TAs / Guests
- Recorded Uploads in Canvas
- Topics
 - Distributed Programming Frameworks (Kompics)
 - Model Checkers (TLA+)
 - Refreshers for Math/Proof Systems
 - Exercise & Project Q&A
 - Guest lectures on specific system areas

ASSIGNMENTS & PROJECT

1. Programming Exercises - **7P**
 - Algorithm Implementations
 - Kompics (Scala) environment

2. Project - **30P + 10P (Bonus)**
 - Individual - no group projects
 - Intermediate reports might be peer reviewed
 - **15P** requirement to **pass**

FINAL EXAM

- Up to **50P**
- Physical Exam as of 2023
- ~Advanced version of graded quizzes
- Tests knowledge of course topics with emphasis in reasoning
- Multiple Choice & Explanation/Proof Questions
- Pass : **25/50P** for A-F course graded part

GRADING SCHEME

For the 4.5 credit A-F graded part the grade is calculated as follows:

Graded Quizzes (max 13P)

+ Programming Exercises (max 7P)

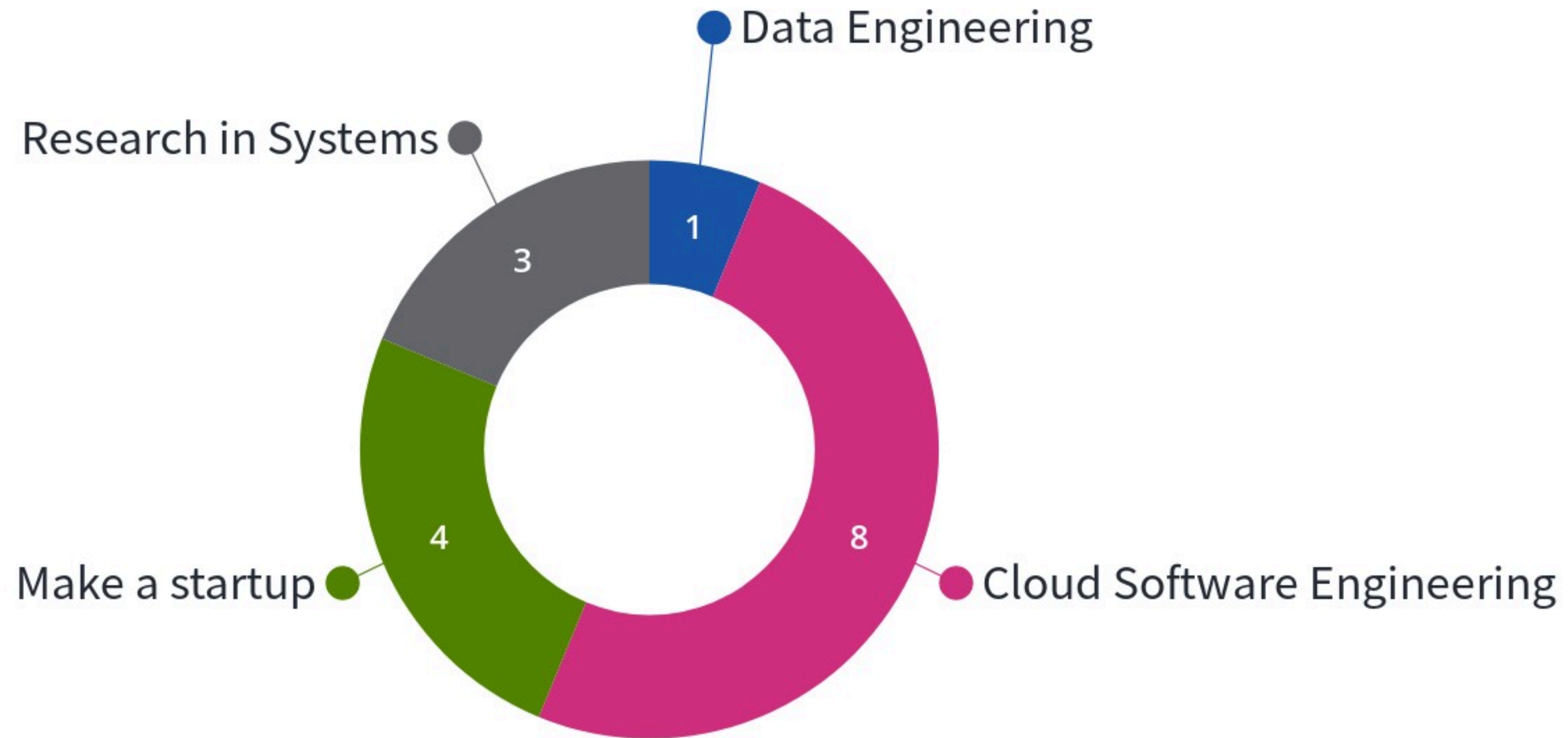
+ Project (max 40P)

+ Exam (max 50P)

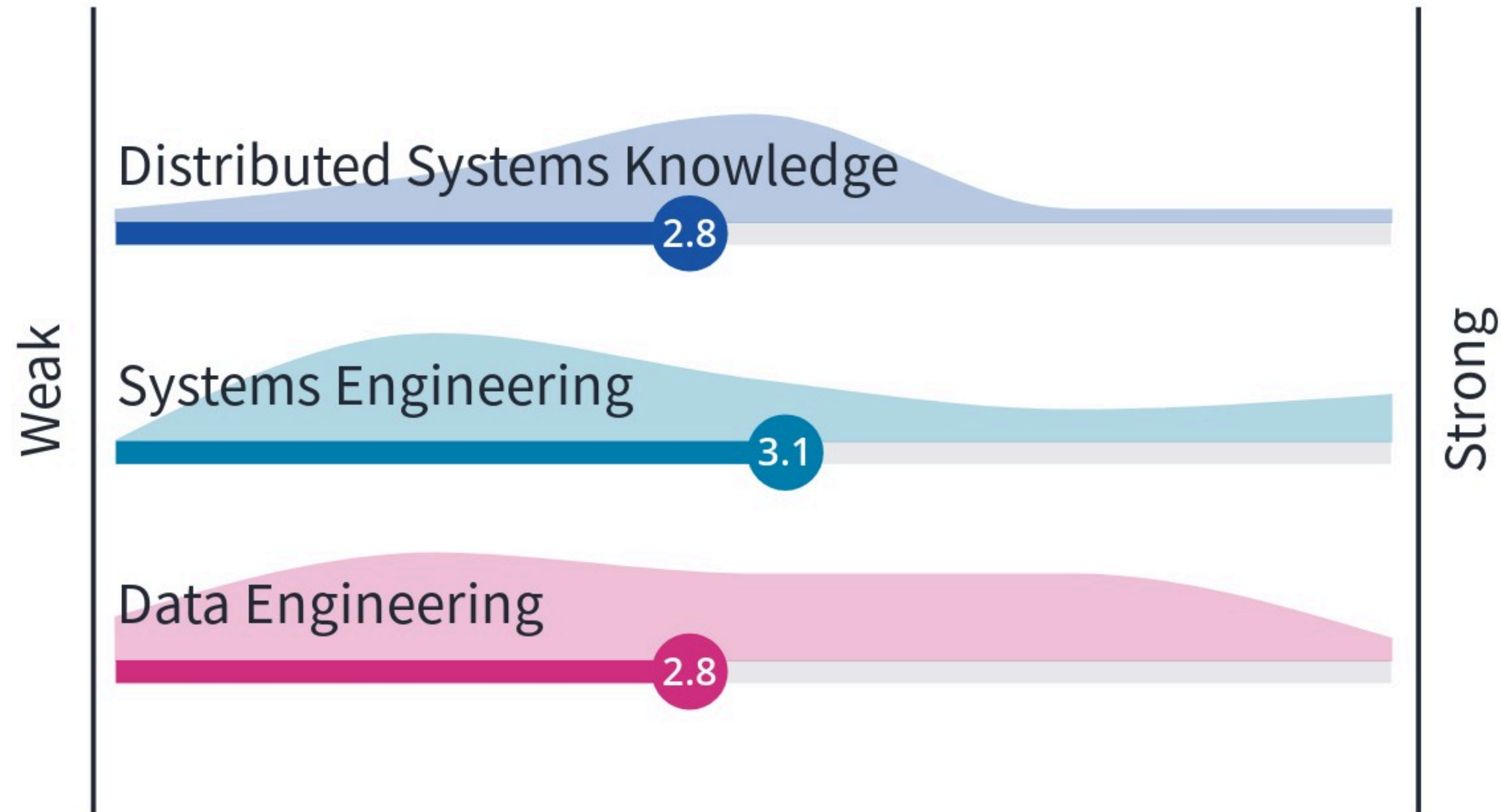
= max 110P

where 90+ A, 80+ B, 70+ C, 60+ D, 50+ E, <50 F

What are your plans after ID2203?



What is in your opinion your level in:



Why are Distributed Systems Important for you?

I am interested in securing the cloud and want to understand how these systems are engineered so I can better protect them at a fundamental level

They are the computer systems that connect people together.

find and develop applications on distributed systems to reclaim digital sovereignty and break the centralization through Google and the other main hubs

My major is Software Engineering of Distributed System.

I have my bachelors in System Eng, and have worked in data ingestion in the cloud and this class joins though concepts

Distributed Systems form the base of cloud computing.

As a data scientist I like to have a bit more perspective on data storage etc. rather than only making simple python visualizations

It's one of the most important concepts for the internet and its new applications that has arisen in the last few years.

Bc they are the enabler of cloud

Why are Distributed Systems Important for you?

They are interesting

Because I like cloud engineering over all and I would like to work p edge of technology. I have all ready worked in serverless computing.