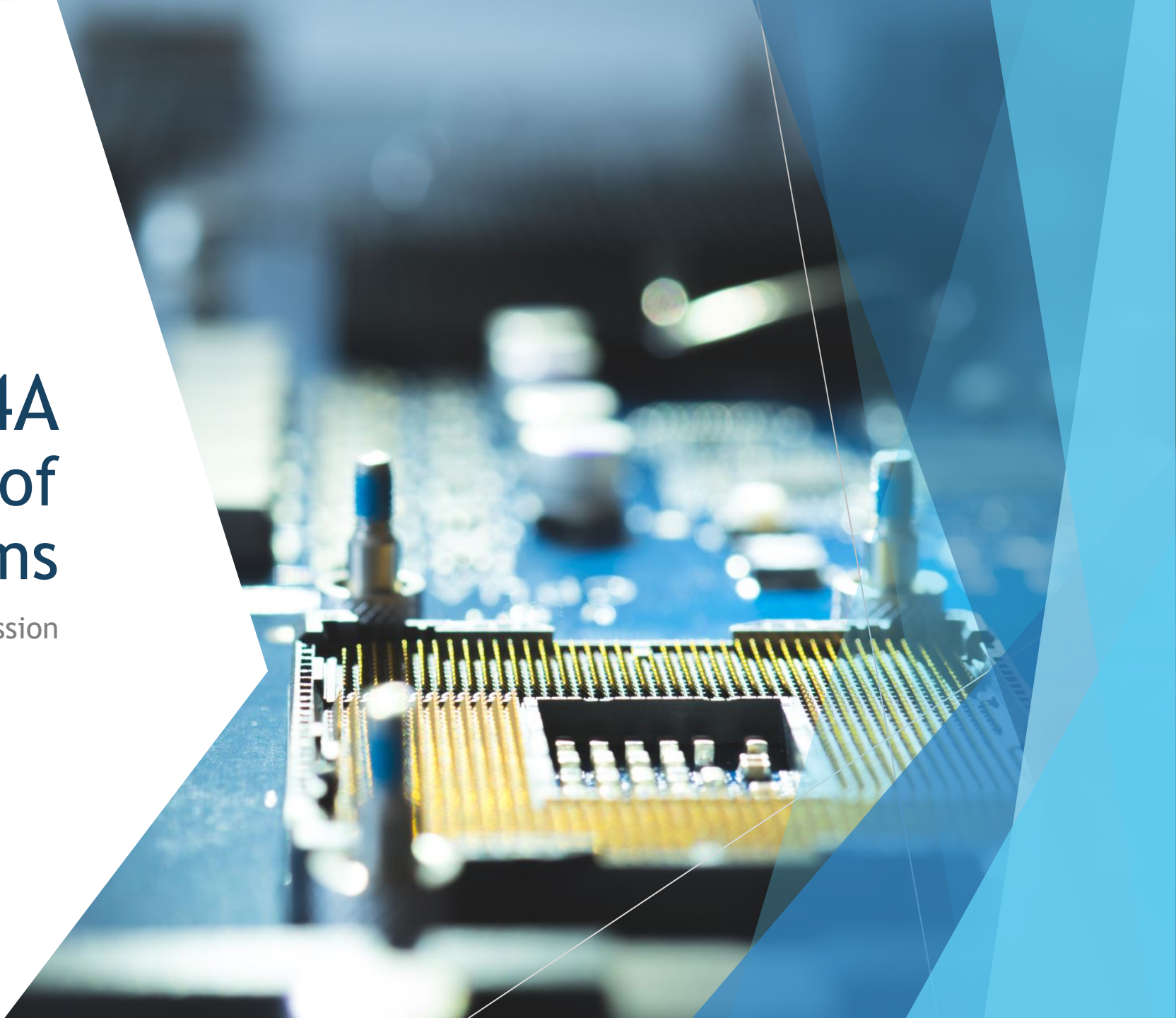
CS 174A
Fundamentals of Database Systems

Discussion Session



Logistics

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www.youngmin.com.mx

- **Office Hours**
  - Wednesday and Thursday, 11:30 – 12:30.
  - Trailer 936.
  - Or by appointment.
- **Questions**
  - General interest? Use Piazza.
  - Individual concern? Make it via private Piazza message to instructors.
  - Anything else you'd like to discuss? Email me ☺
- You may attend any discussion section or office hours by any of the course TAs.

… About your TA

- Software Engineer, Computer Scientist, and currently a PhD student.
- Member of the *Computational Applied Science Laboratory* (CASL)
  - **Office**: Engineering II, Room 2315.
  - **Advisor**: Prof. Frédéric Gibou.
- Research interests
  - Computer Graphics.
  - Machine Learning.
  - Applied Mathematics.

- What I will do:
  - Help you as much as I can.
  - Learn with and from you.
  - Work with you as another teammate.
- What do you expect from our discussion sessions?
- What about materials, slides, etc.?
  - Fetch them from www.youngmin.com.mx/teaching.php

… About Piazza

- Make sure your questions are clear
  - Be specific.
  - Include as much information as possible.
  - For homework assignments and project, avoid posting your (attempted) solution or code – It's against the law!
  - If in doubt, please ask us.
- For questions related to your approach to homework assignments or project, please come to office hours or arrange for an appointment ☺

http://piazza.com/ucsb/fall2019/cs174a

Checking in

- What do you think a database is good for?
- Can you name a few examples of databases? How do they differ?
  - Critical consistency: banks, airplane reservations, etc.
  - Eventual consistency: your preferred social network.
  - Centralized versus distributed.
  - Etc.
- Can you think on the **type of operations** you would perform to a DB?

Queries
Insertions
Deletions
Updates

An Example: Online Store (Amazon)

- What ***kinds*** of data would you store in this Amazon DB?
  - `Products`, `Customers`, `Purchases`.
- What information do you need to store for `Products`?
  - `Name`, `Price`, `Quantity`.
- We acquired a new product to sell on Amazon, but it has the same `Name` and `Price` than an already-existing product in the DB. Is there any problems if we store it in the DB? If so, how would you solve the issues?
  - **Issue**: duplicity. A customer may end up being charged for multiple products they didn't purchase.
  - **Solution**: enforce uniqueness, on, say, a product's `Name`, which may work as the product **ID**.

An Example… Continued

- There are millions of products in the DB, and a customer wants to search for those whose price is within $5 and $10. How do we apply the filter quickly?
  - Create an ***index*** on the product `Price`.
- We have thousands of customers who look and purchase items. How can we handle ***concurrent queries*** to product listings? What about ***concurrent updates*** to a product `Quantity`, for example?
  - Introducing **transactions**.
  - **Locking** system!

And more details and techniques we'll learn to model and implement a well designed database

Questions?