

Welcome to

Business Data Science 2024/25

Social Data Science 2024

Roman Jurowetzki | Hamid Bekamiri | Primoz Konda
| Christian Nielsen | Eskil Olav Andersen
2/9 - 2023



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Stuff from the Meeting

Hey Students

Why Innovation and how do these things connect - with AI, GPT & co? (Primoz)

Guest? 1st cohort student talk? (Christian)

What is AI and why? And what are current AI market trends? + Groupwork. Identify an AI startup - what are they doing? (Roman)

Platforms: Colab, Github, Github codespaces, Huggingface, uCloud ? (Hamid)

Admin stuff overview (Roman)



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The Team



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Roman Jurowetzki



Associate Professor, IKE Group

Technology mapping using unstructured data

Bibliometrics, patents, web-data

Recently very much into studying Neurotechnology

❤️ NLP and unsupervised learning

AI Denmark

Other than that: Dog person, outdoor 🏜, Yoga, Cycling,
Winter Bathing ❄️

Hamid Bekamiri



Assistant Professor, IKE Group
Technology and Science mapping
AI Denmark

Outside of the university, I enjoy outdoor activities, such
as football ⚽ and cycling

Primoz Konda



AI generated image of myself

Post-doc, IKE group

AI Denmark

Other than that: climber, rower,
kayaker, runner etc.

Christian Nielsen



Research Assistant, IKE Group

Recently graduated from Business Data Science in summer 2024

Newcomer to the IKE group and AI Denmark

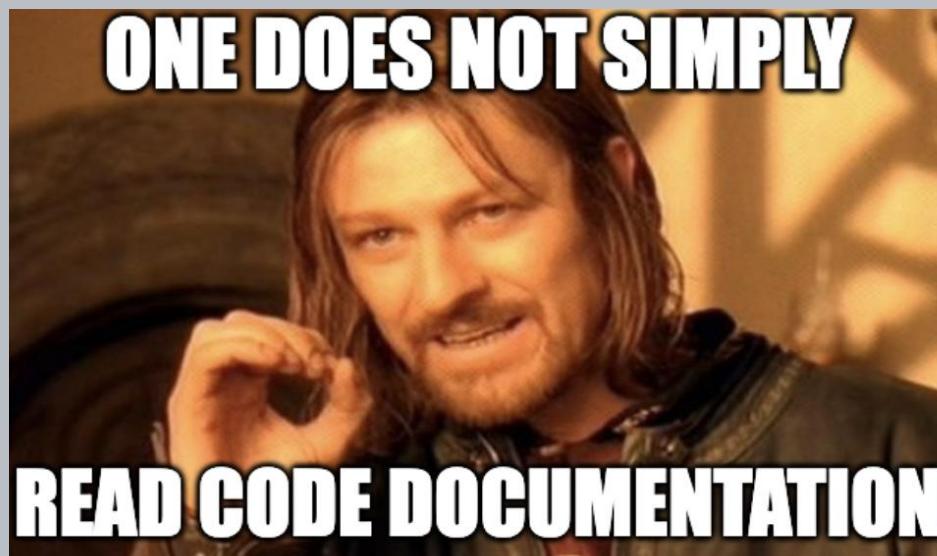
Trend analysis and technology mapping are my focus areas (thus far)

In private; Proud nerd, play around with AI and coding

Teacher assistants

Martha

Patrick



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Meet BDS 2023



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Get to know each other

PSA from the Study Board

With some Rosie the Riveter -inspired AI Artwork

The learning model at AAU and AAUBS

Program Focus: Problem-Based Learning (PBL)

- Builds skills in solving real business challenges
- Mix of independent & team activities

PBL in Action:

- Present in courses, projects, and lectures
- Includes case work & business partnerships

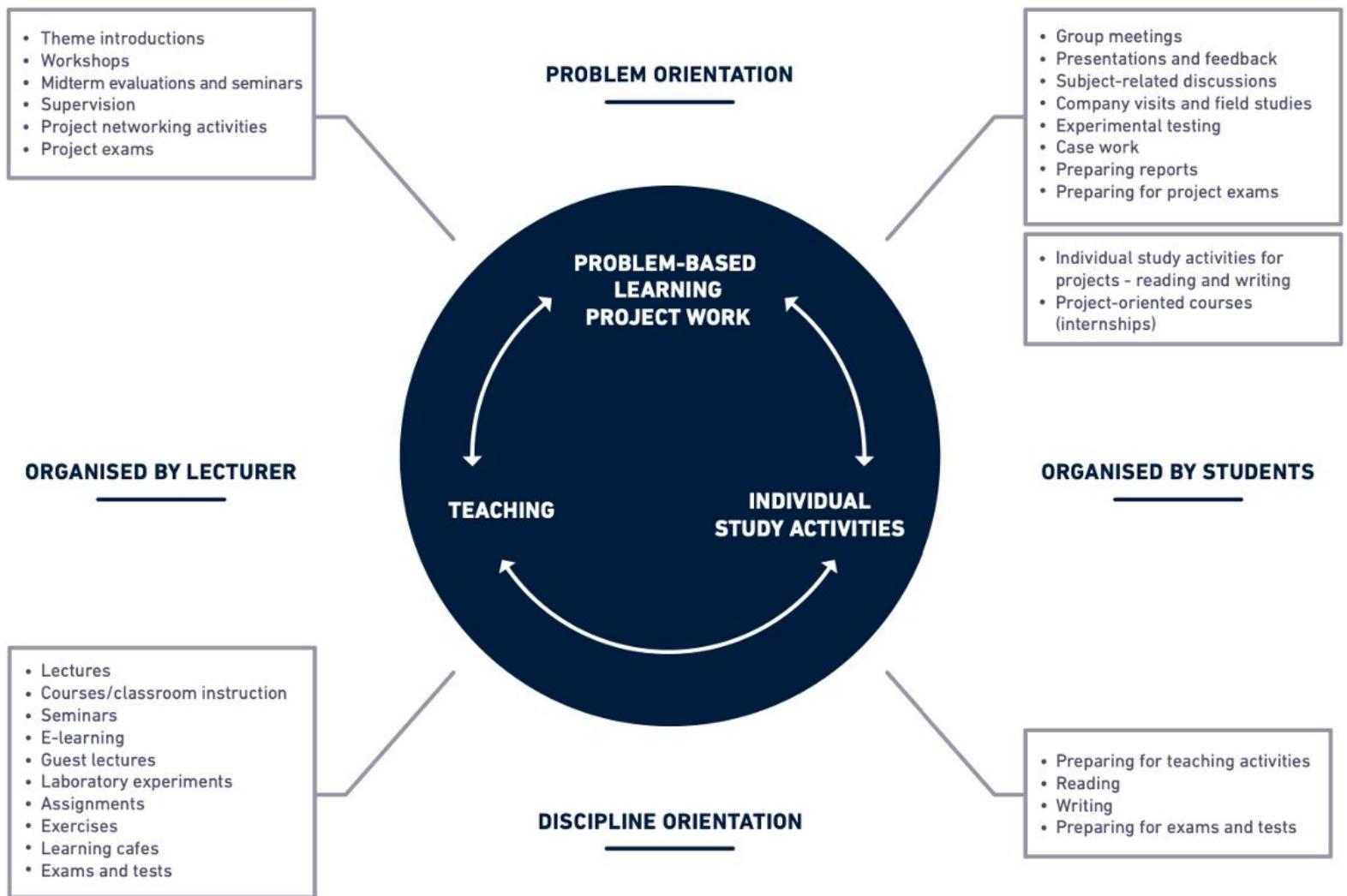
Key Values:

- Interdisciplinary approach
- Teamwork & individual growth

Learn More: PBL Intro Films
(<https://www.pbl.aau.dk/films>)



AAU Study Activity Model



The study activity model at AAU

University programmes in Denmark are full-time. This means that students in Bachelor and Master degree programmes must spend approximately 43 hours in active programme weeks on their studies.

The expected allocation of work hours for a given module can be found in the course description on moodle
(1 ECTS = 27 hours of work)

Example on full semester (30 ECTS):

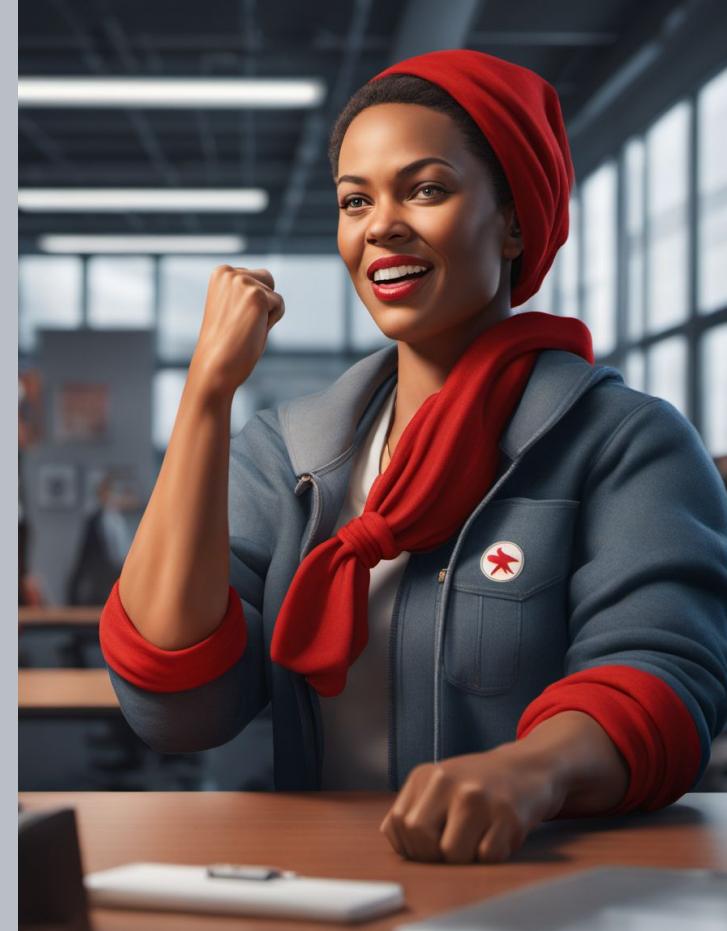
	ECTS	Hours	
Module A	15	405	Module B:
Module B	5	135	8 double lectures (16 hours)
Module C	5	135	8 exercises sessions with teacher (16 hours)
Module D	5	135	16 hours online exercises in Connect (16 hours)
Total	30	810	Preparation for lectures (87 hours)

The Study Board of Economics and Business Administration

- Oversee quality, organization, & development of degree programs
- Manage staff & student involvement
- Affiliated with one or multiple departments

Composition:

- 6 Faculty Members: 4-year term, diverse research & programs, Chair
- 6 Student Reps: 1-year term, cover Bachelor's & Master's, Vice-Chair



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What can the study board help you with?



Quality Assurance:

- Approve semester & course descriptions
- Evaluate student & external feedback
- Liaise with external panels
- Update study framework

Individual Cases:

- Exemption applications (e.g. extra exam time for dyslexia)
 - Additional exam attempts due to special circumstances
 - Advance credit transfers
 - Custom curriculum adjustments
- Contact: forvaltning@business.aau.dk

The programme



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BDS

but why?

- Teaching real, enjoyable content from our research
- Running a PBL-focused, challenging program
- Preparing students for a dynamic job market
- Enjoying working with data & learning together!



BDS in one very improvised slide

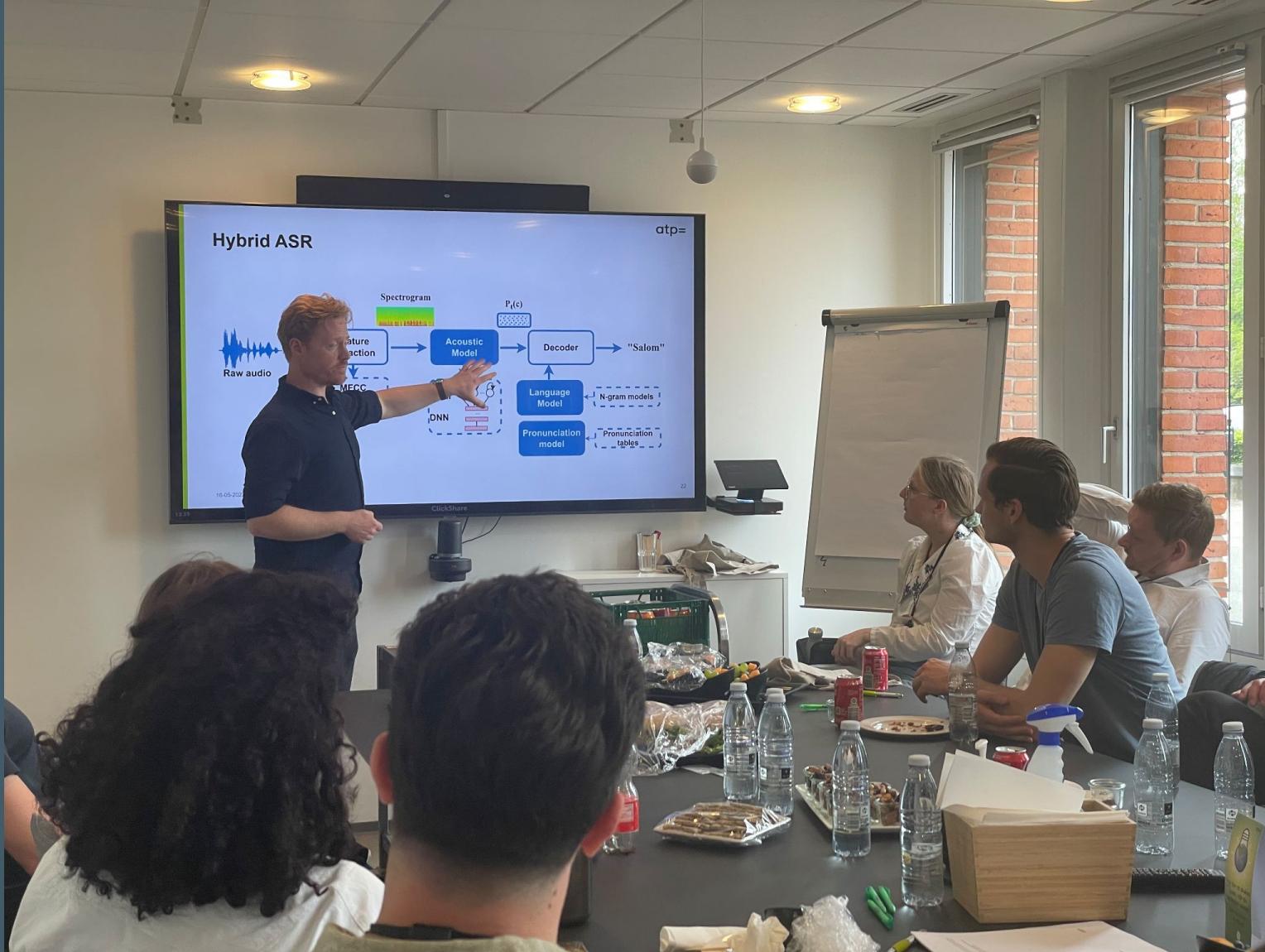


1. semester (2.5 modules + 1 Project)
2. semester
 - a. Deep Learning
 - b. MLOps
 - c. Ethics + Legal
 - d. Project
3. semester: (almost) anything goes
4. thesis

Study Trip



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This Semester



and random AI Generated dogs

M1 - Intro to DS and ML (10 ECTS)
M2 - Networks & NLP (5 ECTS)

SDS - Deep Learning (5 ECTS) & 10ECTS

DS4B - Data Driven Business Models &
Integrated project (15ECTS)



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September-October

Intro to data and EDA

Stats / Math for DS

Visualization & PoC tooling for Business
Analytics

Dashboard hackathon

Data management (APIs, Databases etc.)

UML & Applications

SML & Applications

Getting skilled with industry standard
technologies and platforms (Python, Github,
Streamlit, Gradio, Kaggle etc.)



What should one know “today”?



The Evolving Role of Data Scientists in Business

Data scientists is evolving beyond traditional data analysis -> **expected to be key drivers of innovation within organizations**



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Innovation as a Core Competency for Data Scientists

INNOVATION IN BUSINESS:

- not only having a new idea BUT implementing it in the business
- involves creativity, strategic thinking, and a deep understanding of how businesses operate

ADAPTING TO CHANGE:

- In a rapidly changing technological landscape, those who can innovate will lead
- BDS must be adaptable, open to new ideas, and proactive in integrating emerging tools and technologies, like AI and LLMs, into business practices.



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The Elephant (not) in the room...



Project

BDS:

Analyze business model & implement project
DS methods to build core ML functionality of a
business

SDS:

Business-Econ project with DS methods
Relevant to your program
Open to collaborations but not necessary
Light(er) on theory

Literature and prep. (for now)

General resources:

Data Science Handbook (go-to guide)

Cases, Tutorials, Docs

M2: Theory papers on NWs & NLP for
social/business research

Project: Includes traditional literature

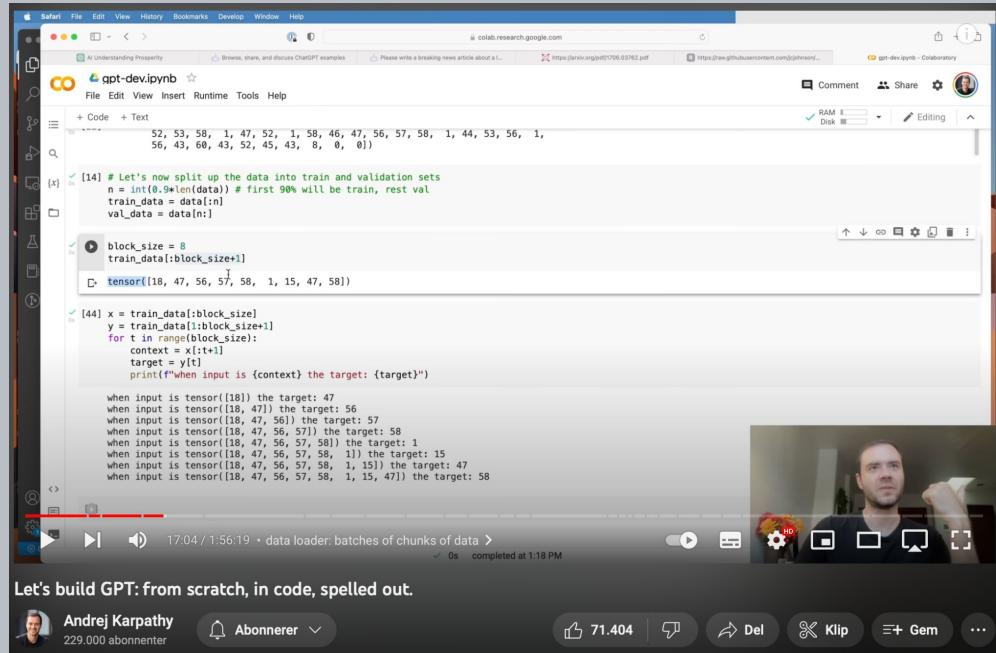
Datacamp

Flexible: No single "best" source for learning



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Don't underestimate YouTube & co



Use all the other resources out there.
(Sometimes YouTube is better than an academic paper...)

Many many many industry podcasts - great source for new skills, cases, potential jobs...

Use LinkedIn

Danish Data Science Academy

Where is the stuff?



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EN

All courses

Guest

Search

Help ▾

Links ▾



Course overview

Moodle

E23 ▾

Sort by course name ▾

List ▾

Search

Business Data Science

Cand.Oecon – Applied Deep Learning and Artificial Intelligence – E23

Business Data Science

MSc BDS 1. semester – Data-Driven Business Modelling and Strategy – E23

Business Data Science

MSc BDS 1. semester – Introduction to Data Handling, Exploration & Applied Machine Learning – E23

Business Data Science

MSc BDS 1. semester – Natural Language Processing and Network Analysis – E23

Business Data Science

MSc BDS 1. semester – Secretariat – E23

MS Teams

The screenshot shows the Microsoft Teams interface. On the left, the sidebar displays various team channels and settings. The 'BDS23' channel is selected, showing its home page, Class Notebook, Classwork, Assignments, Grades, Reflect, and Insights sections. Below these are the 'Channels' section with 'General' and 'Instructors' listed, and the 'Apps' section.

The main area shows the 'General' channel of the 'BDS23' team. The channel header includes tabs for General, Posts, Files, and a plus sign. A 'Meet' button is in the top right. The channel content shows a message from Yasmine Sarraj at 24/08 12.05:

Yasmine Sarraj 24/08 12.05
Hello new people, I am Yasmine Sarraj, and I'll be one of the TAs with Christian. We just started our second year of this master's program. I am originally from Switzerland and moved a year ago to Aalborg for my master's. Other than that I like swimming and hiking in the mountains (shame there is none in Denmark). Looking forward to meeting you byyyye.

Below this message is a deleted message from Hamid Bekamiri at 24/08 12.32:

Hamid Bekamiri 24/08 12.32
Hello everyone,

Hamid's message was deleted, indicated by a trash can icon and the text "This message has been deleted."

Christian Nielsen's message at 24/08 12.55 follows:

Christian Nielsen 24/08 12.55
Hello guys and gals!

Christian's message continues below:

I am Christian Nielsen, and I am a TA along with Yasmine. I'm from the local area, and have experience in different fields, such as warehousing and logistics surrounding that, before I started on the academic path. I finished my bachelors in business administration and

Daniel S. Hain's message at 24/08 13.28 concludes the visible content:

Daniel S. Hain 24/08 13.28
Alright, it's introduction time 😊

A 'New conversation' button is located at the bottom center of the channel view.





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AAUBS Data Science 2024

Search... x

Info, Schedule & Co

1. Applied Data Science and Machine Learning

Clear History

Built with ❤ from Grav and Hugo

SOCIAL & BUSINESS DATA SCIENCE 2024

Aalborg University Business School



HANG IN THERE,

BABY!



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Finally...

What are we doing here...?

It's about learning. More generally

Data = something that can be observed / sensory input (sometimes)

Describing data gives us some basic understanding

Unsupervised Learning: Identifying patterns in data

Supervised Learning: Linking patterns to some outcome of interest
(and optimizing towards...)

Building systems that can learn (training) and replicate cognitive tasks (inference)



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What about Math?

$$c_j = \operatorname{argmin}_{c \in \text{centroids}} \|x_i - c\|^2$$

```
distances = np.linalg.norm(data[:, np.newaxis] - centroids, axis=2)
cluster_assignments = np.argmin(distances, axis=1)
```

$$c_j = \frac{1}{|C_j|} \sum_{x_i \in C_j} x_i$$

```
new_centroids = np.array([data[cluster_assignments == i].mean(axis=0) for i in range(k)])
```

