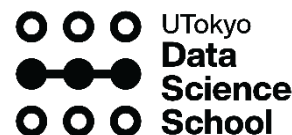


Promoting Collaboration between Academia, Industry and the International Community through Data Science

Ryohei Hisano, Ryoma Kondo

Mathematics and Informatics Center / Department of Mathematical Informatics,
Graduate School of Information Science and Technology, The University of Tokyo
@Symposium University of Tokyo – ETH Zurich – University of Zurich, Oct 15 – 17,
2023

<http://dss.i.u-tokyo.ac.jp>



Graduate School of Information Science and Technology

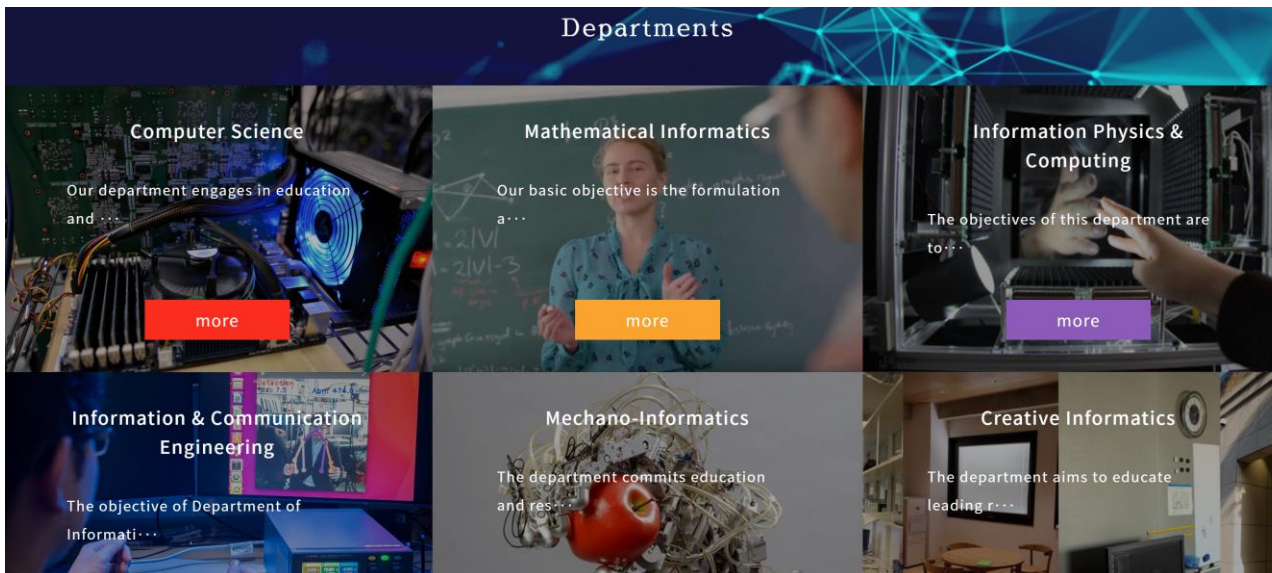
□ Established in April 2001

□ Goals

- Aims to deepen and advance knowledge in informatics, fostering global leadership through a systematic curriculum and hands-on research while promoting **societal and international collaboration**

□ Good at theories but ...

Generated image using
stable diffusion

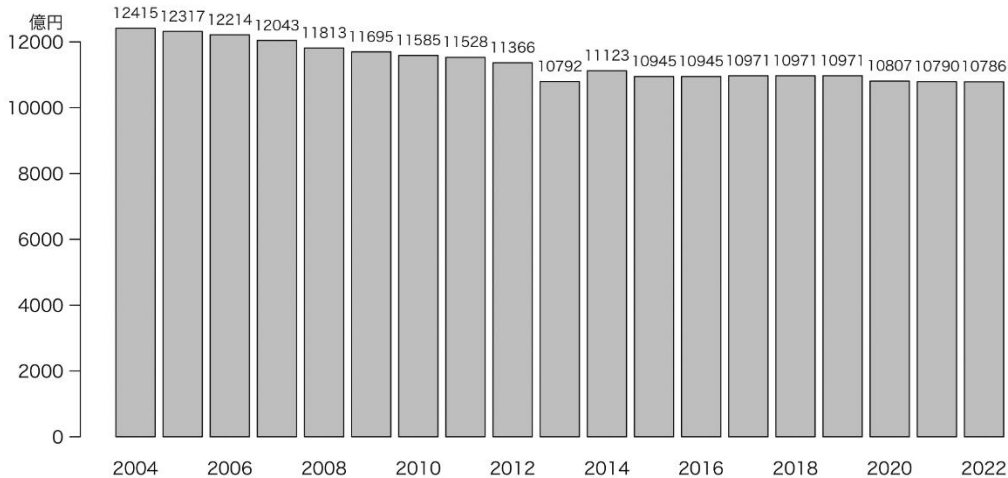


Situation surrounding national universities

- From 2004: Management subsidy decreasing at an annual rate of 1%
 - 124,150 $\times (0.99)^{19} = 124,150 \times 0.834 = 103,600$ mil yen
 - 2022: 107,860 mil yen
- We divide this by about **90 univs**

Management subsidy

国立大学法人運営費交付金



[MEXT2020]

Tuition

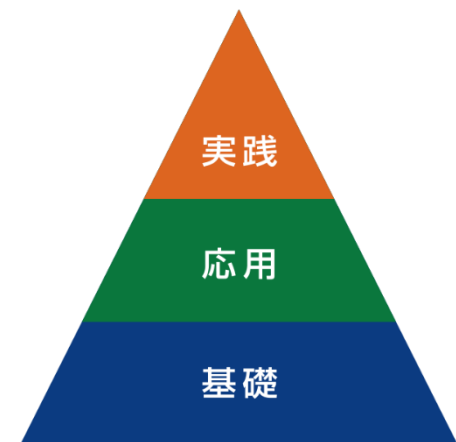
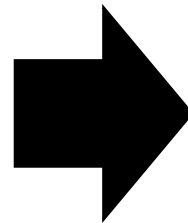


Hospital

(収入)	(支出)
授業料等 3,633億円 (3,632億円)	基幹経費 13,202億円 (13,263億円)
雑収入 349億円 (316億円)	
運営費交付金 10,807億円 (10,971億円)	
(基幹運営費交付金 10,019億円 → 9,867億円)	機能強化経費 647億円 (704億円)
(特殊要因運営費交付金 952億円 → 940億円)	特殊要因経費 940億円 (952億円)
附属病院収入 11,674億円 (11,158億円)	附属病院経費 11,674億円 (11,158億円)
運営費交付金 算定対象事業費 26,462億円 (26,077億円)	264億円 (新規)
高等教育修学支援新制度の 授業料等減免分(内閣府計上)	264億円 (新規)

UTokyo Data Science School (DSS)

- Organized By: Graduate School of IST
 - Build courses that specifically focuses on industry academia collaboration
 - Already had solid basic courses but: “Put the cherry on the top of the cake”
- Originally started in April 2016
- **Notified that it is no longer funded by govern (Mid 2021)**
- **Renovation: Became a sponsored program from October 2022**
- **Formal completion certificate for the Data Science course (Basic, Applied, Practical)**
- **+ Award."**



DSS and DSP

□ Deepening Engagement

- Established "Excellence RA (Research Assistant) System"
- Focus: Finance and FinTech
- Student Count: Around 10 students (as of April 2023)

DSS (1 semester × 2)

DSP (1 year~)

Corporate
representatives

Young Corporate
representatives



Professors

Postdocs

TA·RA

Students

Corporate
representatives

Young Corporate
representatives



Project based
Excellence RA

Practical Data Mining I/II

- Engaging with Real-World Business Data
- Collect high-impact data and challenges from businesses.
- Engage in communication with companies while: Students work in groups to analyze and provide solutions.
- Learning Methodologies to create value in the real world.

Key Features:

- **Practical Data Analysis:** Analyze data used in real-world settings from a business perspective.
- **Feedback:** Receive feedback from active business professionals.
- **Analytical Focus:** Not just about 'how' to analyze, but also 'what' to analyze.



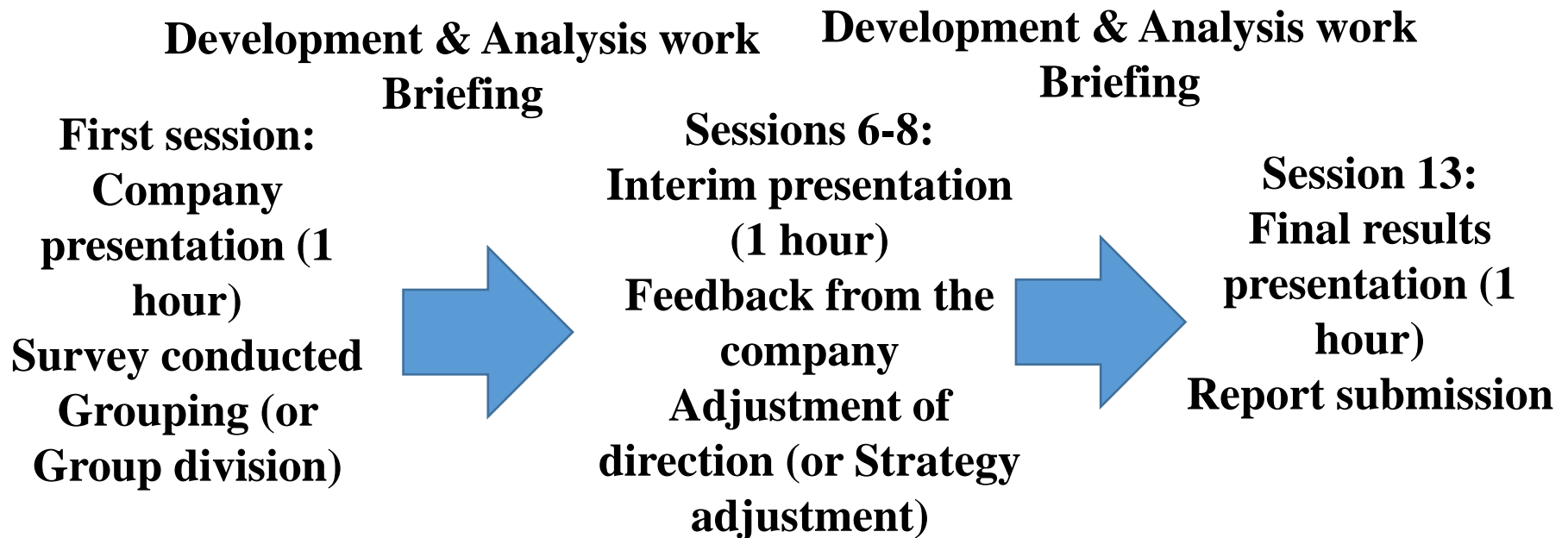
講座の様様。 画像提供：山西研究室

Comparison with traditional typical lectures

	Traditional typical lectures	Practical Data Mining I/II
Method	Lecture-based	Practical exercises
Focus	Academic interest	Business interest
Data	Textbook data	Frontier challenges & real data
Purpose	Proven technology	Toward significant value creation

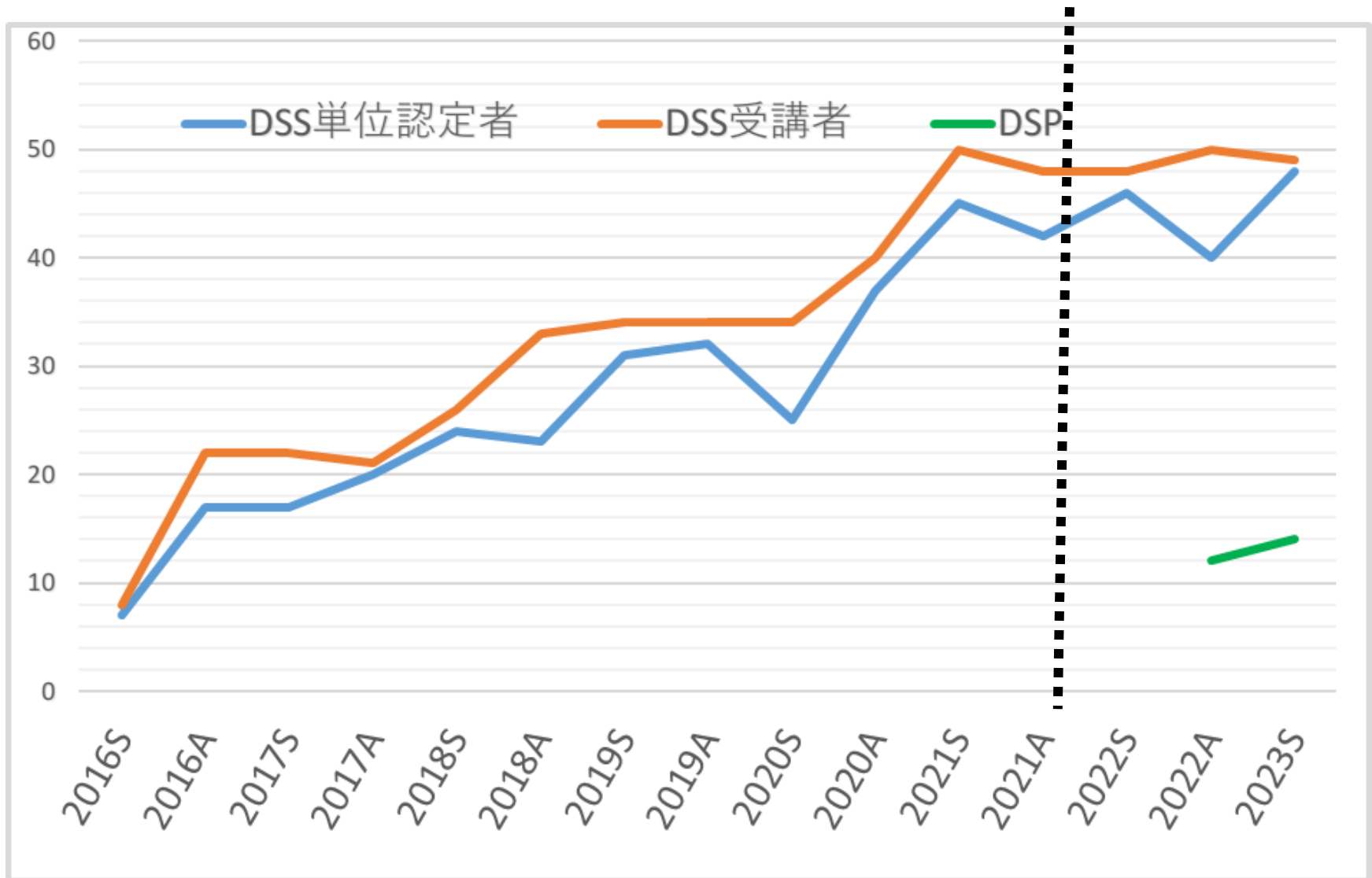
Course Structure

- 13 times per semester (2 sessions: 3.5 hours each)
- 2 faculty members, 2–5 TAs assisting with analysis
- 5–12 students per group (Totaling around 30–50 students)
- Engaging with approximately 4–8 companies
- Intensive short-term course



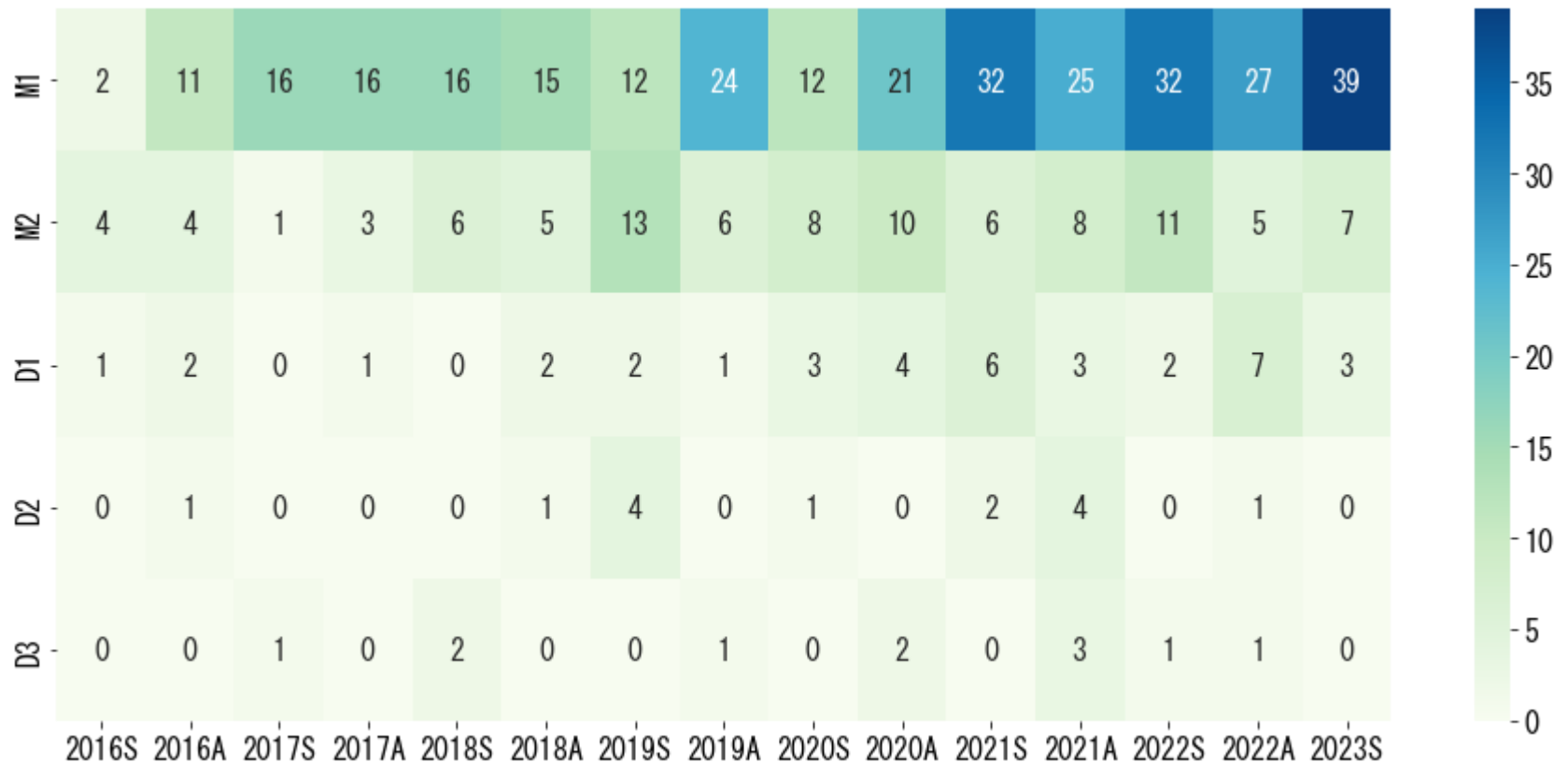
Companies participate at least three times.

Registrants and graduates **Notified that no longer funded by gov**



Transition in the number of graduates by year

- M1 students are the main participants.
- Students from M1 to D3 have widely completed the course





Examples that led to joint research and press releases

Spring term of fiscal year 2019: Mizuho Bank

➔ A press release was issued on September 26, 2019

➔ The results were solely from the practical lecture



2019年9月26日
株式会社みずほ銀行
みずほ情報総研株式会社
東京大学 大学院情報理工学系研究科

先進的テクノロジーを活用したチャート分析システムの共同開発について

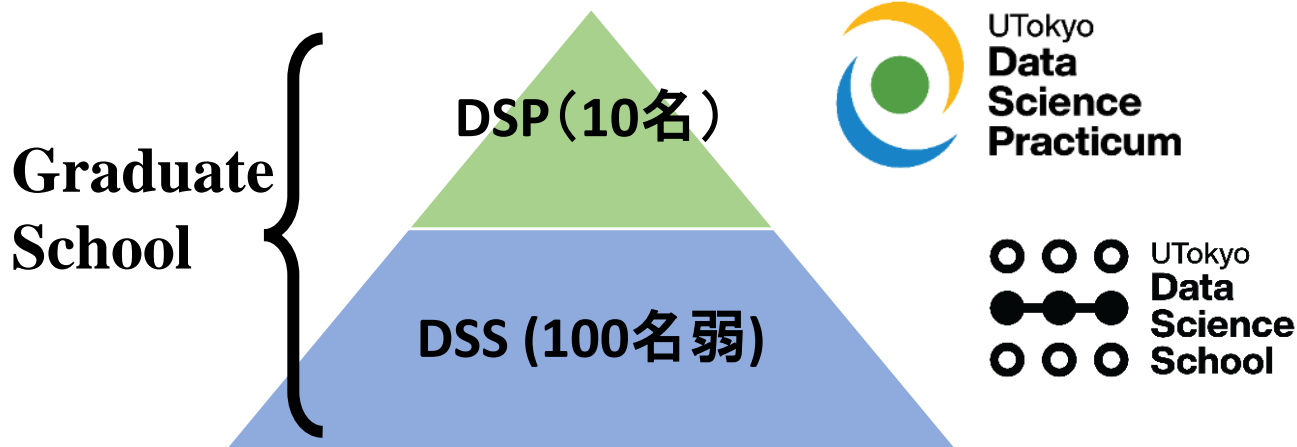
株式会社みずほ銀行（頭取：藤原 弘治、以下「みずほ銀行」）、みずほ情報総研株式会社（代表取締役社長：向井 康真、以下「みずほ情報総研」）と東京大学 大学院情報理工学系研究科（研究科長：石川 正俊）は、同研究科が実施する「東京大学データサイエンティスト養成講座（領域知識創成教育研究プログラム）」（以下、「東京大学データサイエンティスト養成講座」）のデータ解析演習プログラム（データサイエンス実践演習Ⅰ・Ⅱ）の中で、株・為替・金利等のチャートの形状から、過去に類似したチャートの形状を持つ時期を発見するアルゴリズムを開発し、今月よりみずほ銀行の市場業務において利用を開始しました。

Ongoing research projects
with the Mizuho FG

➔ More on this tomorrow

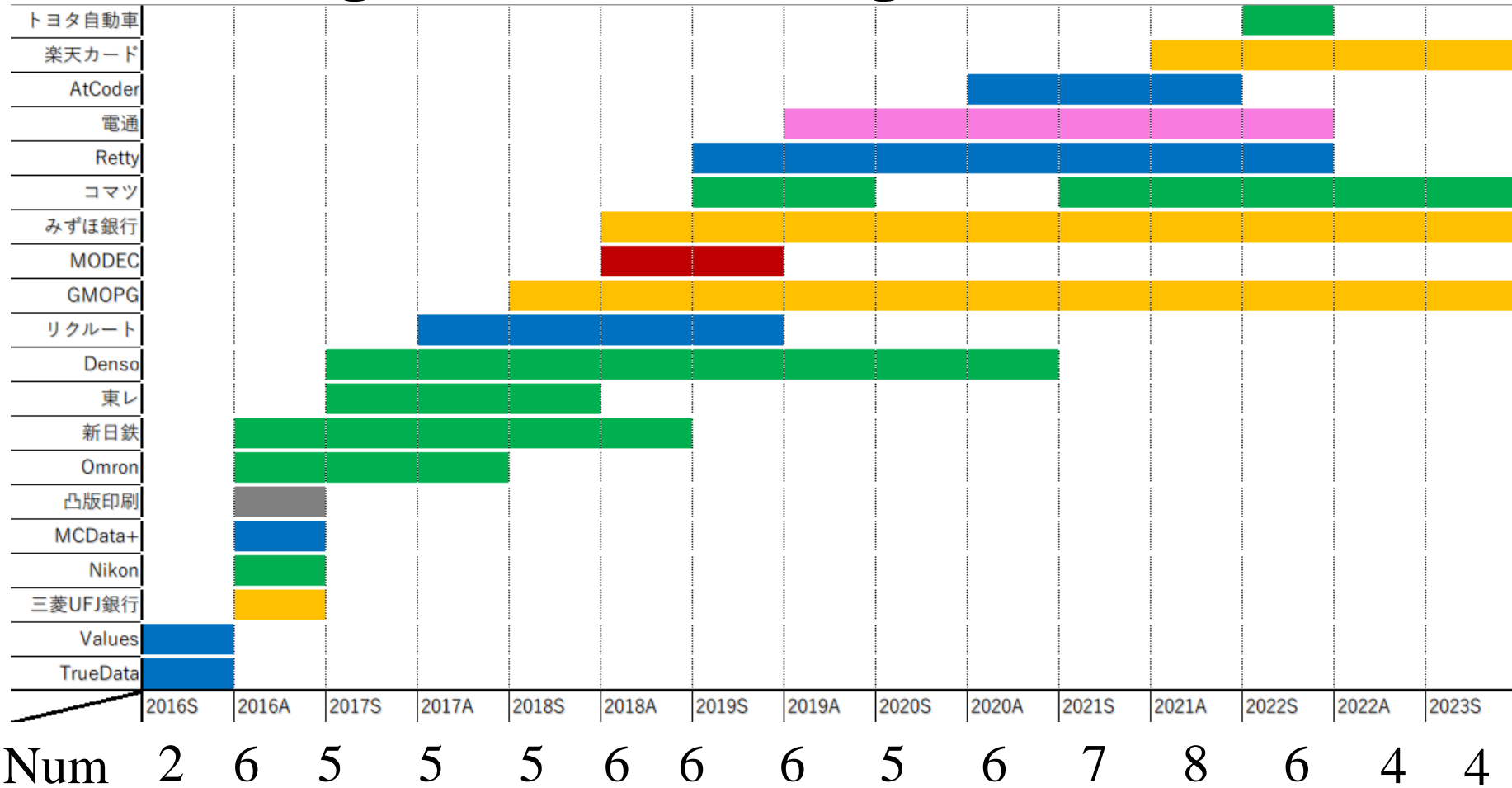
DSP

- Collaborative Problem Solving
 - Companies, faculty, and students work together as one unit
 - **Project-Based Excellence RA program**
 - Annual engagement (similar to a long-term internship: collaborative development on git)
- Meetings & Collaboration
 - Companies, faculty, and students meet bi-weekly (close collaboration).
 - Faculty and students meet weekly
- Current Theme: Finance and FinTech



Participating companies

□ Participants from a wide range of industries including IT, manufacturing, and finance



Symposium

- Annual Symposium
 - Held every year in June–July
 - Strengthening Industry–Academia Collaboration
- Companies, faculty, and students gather under one roof
- Alumni Homecoming Day

2022
189
participants
(On-site:
78,
Online:
111)



東京大学 The University of Tokyo | 東京大学 情報理工学系研究科 | DSS

— あいさつ
須田礼仁
東京大学 大学院情報理工学系研究科 准教授

— DSSの参みと今後
久野遼平 宮口航平
東京大学 大学院情報理工学系研究科 講師 | 東京大学 大学院情報理工学系研究科 准教授

本脇太一 南賢太郎
東京大学 大学院情報理工学系研究科 特任講師 | 株式会社Preferred Networks フォーダー

— 基調講演
山西健司
東京大学 大学院情報理工学系研究科 教授

大西立顕
東京大学 大学院人工知能科学研究所 教授

— 企業講演
電通
コマツ
みずほ銀行
楽天カード株式会社
トヨタ自動車株式会社
GMO ペイメントゲートウェイ

第一回東京大学データサイエンティスト
養成講座シンポジウム 成務館に向けたまご教習D5教育

事前登録制
2022.6.30
13:00 — 18:00

QRコード

「データのバブルは続くのか?」
データサイエンス・

2023
152
participants
(On-site
only)



東京大学 The University of Tokyo | 東京大学 情報理工学系研究科 | U-Data Science School | U-Data Science Practicum

— 基調講演
「データサイエンスにおける大規模言語モデルの活用と課題」
宮尾 祐介
東京大学大学院情報理工学系研究科 教授

— 企業講演
みずほ銀行
GMO ペイメントゲートウェイ
楽天カード
コマツ

— 招待講演
「画像・顕微鏡特異性のための機械学習を用いた分子構造最適化」
梶野 洸
ISIR 東京理科大学 准教授

「英国学海外での学習理論研究：空想の構造と機械学習視点」
鈴木 惇
Lecturer in Machine Learning, King's College London

「産業と MSR AI4Science でやろうとしていること」
富岡亮太
Principal Research Manager, Microsoft Research Cambridge

— ポスターセッション 一懇談会
DSS・DSP 関係者 学生無料 ※事前登録制

第二回東京大学データサイエンティスト
養成講座シンポジウム

事前登録制
2023.7.7
15:00 — 18:00

QRコード

「次世代AI技術とデータサイエンス」

Symposium 2023.7.7

Event Highlights

- Poster session combined with a standing buffet party
- Discussions on the future of data science
- Alumni Participation

It was a great success!



Official merchandise of
the University of Tokyo



Digital Competitiveness Ranking (2022)

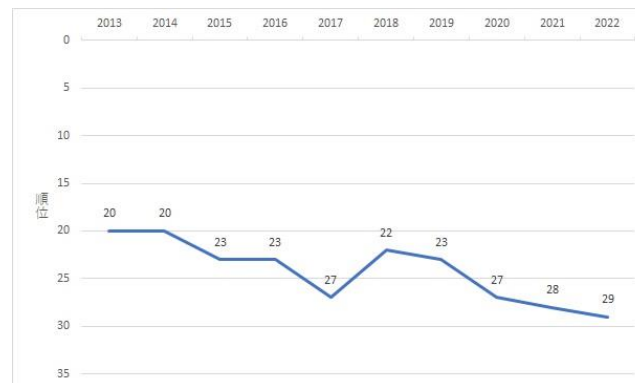
- World Digital Competitiveness Ranking – IMD Business School
- Overall: 29th/63 countries (Declined from previous)
 - Knowledge: 28th
 - Technology: 30th
 - Preparation for the Future: 28th
- Talent: 50th / 63 countries
 - International Experience: 63rd
 - Digital/Technical Skills: 62nd
 - Regulatory Framework: 47th
 - Business Agility: 62nd
- Note: Pronounced shortage of digital talent.

Digital Competitiveness Ranking (2023)

- Would be released on Nov 23, 2023
 - Have we yet to ascend from our lowest point? Or...
 - <https://www.imd.org/centers/wcc/world-competitiveness-center/>



- Evolution of Jap ranking
 - <https://data.wingarc.com/imd-world-digital-competitiveness-ranking-2022-57002>



Collaboration with Zurich

- Perhaps education as well?
- Prof Dr Claudio Tessone, UZH Blockchain Center

UZH
Blockchain
Center

- Prof Dr Tilmann Altwicker, Center for Legal Data Science – UZH

CLDS
Center for
Legal Data Science

**More on
research
tomorrow**

Summary

- The University of Tokyo Data Science School is a program to promote societal and international collaboration at the IST
- It's already creating opportunities we never would have had otherwise
- International collaboration isn't something we merely want to do; **it's something we must do**
 - **At the very least, we want to move out of the bottom of the rankings**