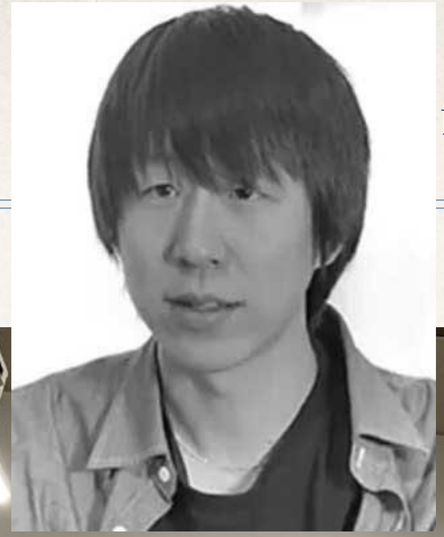
金子・シン研：20年後の情報サービスインフラ

慶應義塾大学 理工学部情報工学科/デジタルメディア・コンテンツ統合研究センター　金子 晋丈

研究室配属説明会　2026/10/26

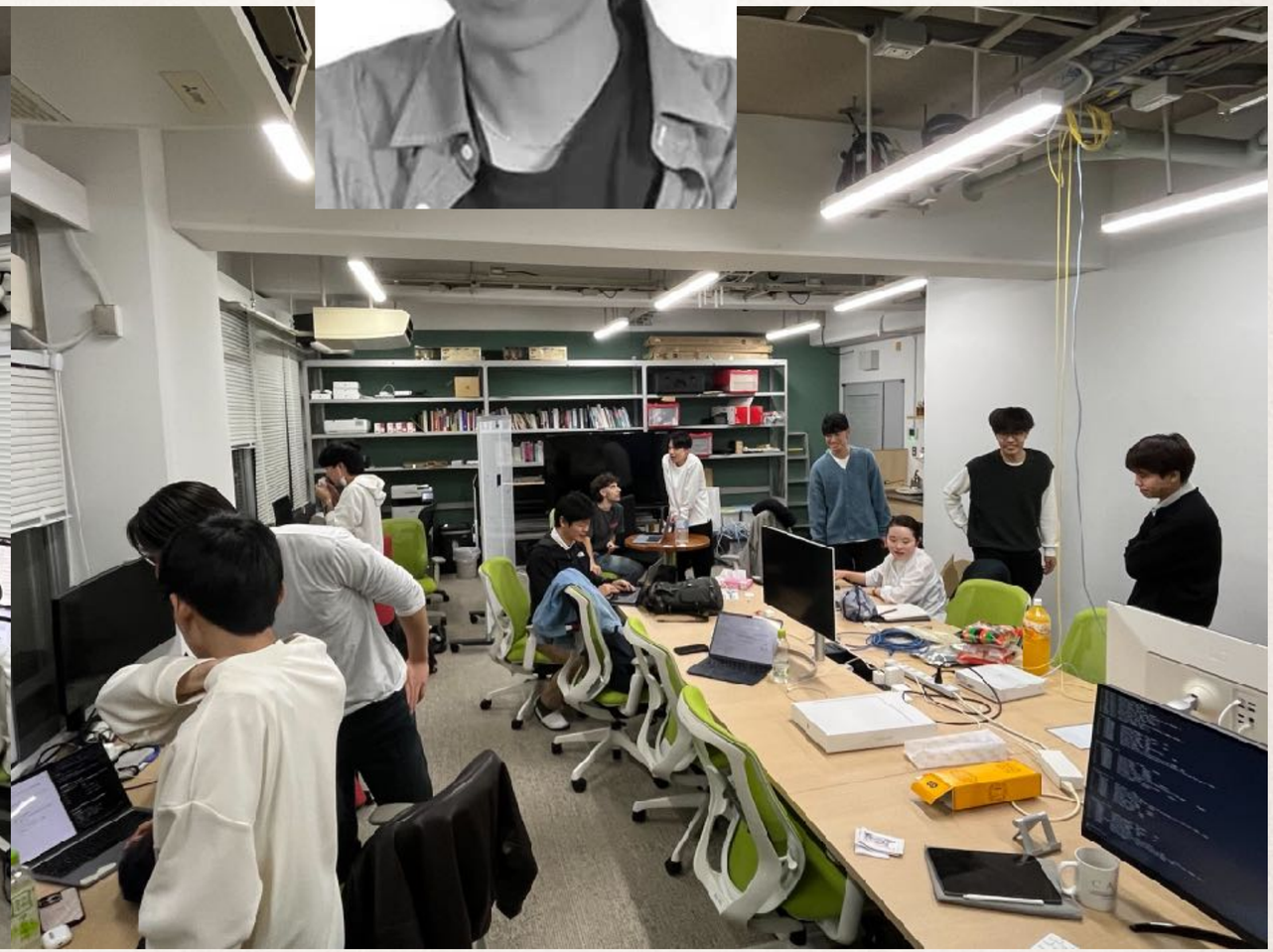
研究室の雰囲気



シン先生

LLM, コンピュータビジョン など
機械学習が専門です





今、情報インフラが直面していること

- AIが情報インフラを直接使う時代
- 情報漏洩、情報セキュリティ、デジタル主権
- 放送の巻き取り
- リッチな通信技術 (Fiber, Beyond 5G, LEO)

50年前の設計では
耐えられない

- 自分が将来使う情報インフラを自分の手で作ってみませんか？
  - 情報技術を駆使した将来の情報サービスとは？
  - AIをどう組み合わせた情報サービスを実現したいですか？

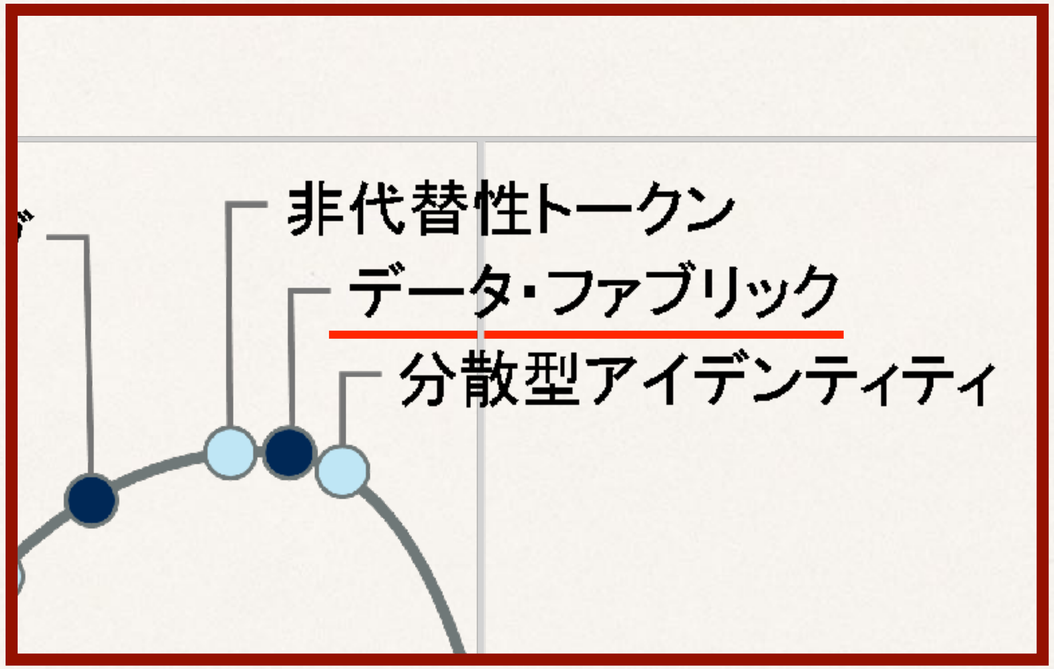
ネットワークシステムを考えよう

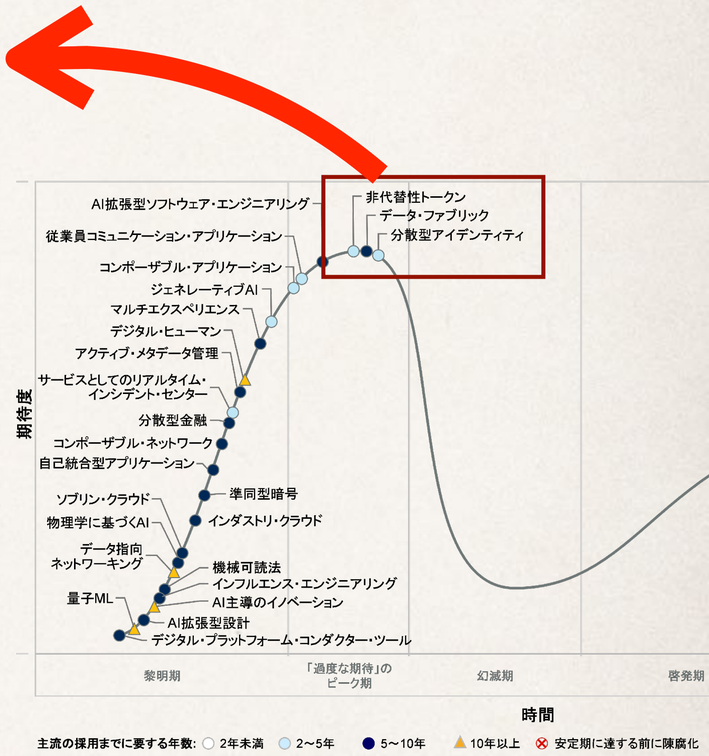
- ネットワーク＝インターネット、TCP/IPではない
- システムなくしてサービスなし
  - 豊かなサービスの肝はサービスが動くシステムにかかっている
- グラフ演算による情報のグローバルクラスタリング
- 仮想化・分散された大規模コンピュータシステム



世界が欲しい技術：データファブリック







先進テクノロジのハイプサイクル (Gartner@2021.8)

2025年のonlineデータ

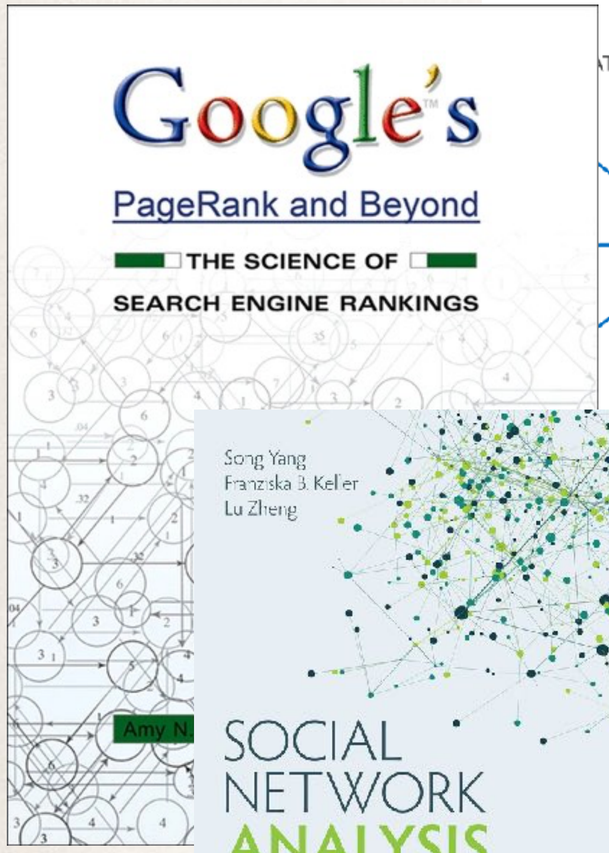
175ZB (除くofflineデータ)

データ利活用インフラが大きなニーズ

大いなる可能性を秘めたグラフの世界

海外大学で
グラフの授業も増加中

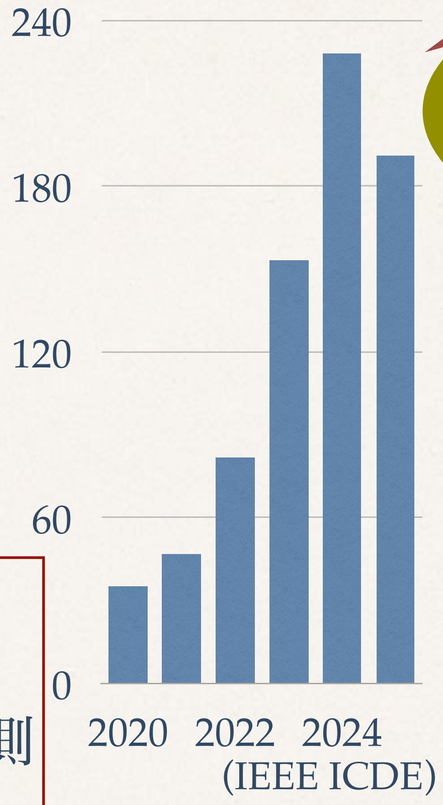
トップカンファレンスで
アツい領域





AIの基盤技術

- 検索結果の順位付け
- 地図アプリの経路探索・混雑予測
- SNSの各種推薦
- チャットボットのトピック抽出



すべてを分散

8 グラフは
すべてを
関連付ける

9 拡張された

グラフ処理：AIの基盤となる情報処理技術

Kunitake Kaneko, Dept. Information and Computer Science, Faculty of Science and Technology / Research Institute for Digital Media and Content, Keio University, [kaneko@dmc.keio.ac.jp]

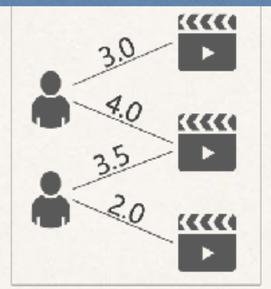
IEEE Infocom 2026 Demonstration

A User's Favorite Movies



ratings.csv	movies.csv
1,1,4.0	1,Toy Story (1995)
1,110,4.0	2,Jumanji (1995)
1,158,4.0	3,Grumpier Old Men (1995)
1,260,4.5	4,Waiting to Exhale (1995)
1,356,5.0	5,Father of the Bride Part II (1995)
1,381,3.5	6,Heat (1995)
1,596,4.0	7,Sabrina (1995)

Personalized Graph Computation controlling popularity bias



Graph from MovieLens dataset

Recommended Movies

(Graph Computation Results)

#	Title
1	The Shawshank Redemption
2	Inception
3	Fight Club
4	The Godfather
5	The Matrix
6	Forrest Gump
7	The Silence of the Lambs
8	The Dark Knight
9	The Lord of the Rings: The Fellowship of the Ring
10	The Godfather: Part II

LLM Explanation

📜 Overall Review

Based on your preferences, it's clear that you strongly resonate with "dramas that shed light on the human inner self" and "stories that depict the cruelty of fate and the power of hope." If you love works where social themes intersect with personal emotions, the following films are sure to be deeply moving experiences for you.

🌄 Dramas of Hope and Rebirth

The Shawshank Redemption (1994): A moving film that depicts the strength of the human spirit, which never loses hope even in the face of overwhelming injustice and despair. It resonates with the "faith in human dignity" found in Schindler's List and CODA. It is a film that quietly yet powerfully cleanses the soul.

Forrest Gump (1994): The warmth that embraces life's pains and joys connects with films like Slumdog Millionaire and Cinema Paradiso. It is a miraculous story of how an innocent heart illuminates the world.

(omitted)

✨ Summary

You are a movie fan drawn to stories that believe in "human dignity and hope." This list features nothing but masterpieces with profound themes—films that look straight at life's pain while still looking forward. Each one will leave you with a quiet afterglow and a sense of hope long after the credits roll.

T. Yamashita, K. Natori, K. Kaneko, "Decoupling information exploration and explanation for personalized recommendation with LLMs," IEEE International Conference on Computer Communications, demo paper, Tokyo, May 2026

Kaneko, Kunitake [kaneko@dmc.keio.ac.jp], Dept. Information and Computer Science, Faculty of Science and Technology / Research Institute for Digital Media and Content, Keio University

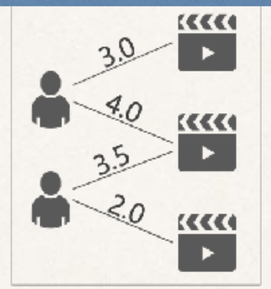
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Personal AI

Area Dedicated AI

T. Yamashita, K. Natori, K. Kaneko, "Decoupling information exploration and explanation for personalized recommendation with LLMs," IEEE International Conference on Computer Communications, demo paper, Tokyo, May 2026

Kaneko, Kunitake [kaneko@dmc.keio.ac.jp], Dept. Information and Computer Science, Faculty of Science and Technology / Research Institute for Digital Media and Content, Keio University

$AI_{Telecom}$ vs. $AI_{Internet}$

- **Telecom-like** Current Information Services
  - Very limited operators
    - Hyperscalers: Google, Microsoft, Baidu, Meta,
    - AT&T, NTT, BT,
  - Limited services
    - Limited by few models
    - Limited to telephony
  - Higher quality
    - Clear answer in natural language
    - Guaranteed bandwidth

Which will advance Information Services (AI) for long-time?



Telecom style
(Vertical ecosystem)

Internet Style
(Modular ecosystem)

- **Internet-like** Future Information Services
  - **Autonomous, decentralized, best-effort, open, exanded application ecosystem, user-driven, incremental deployment**

Internet-style networks of information resources with scalability and flexibility

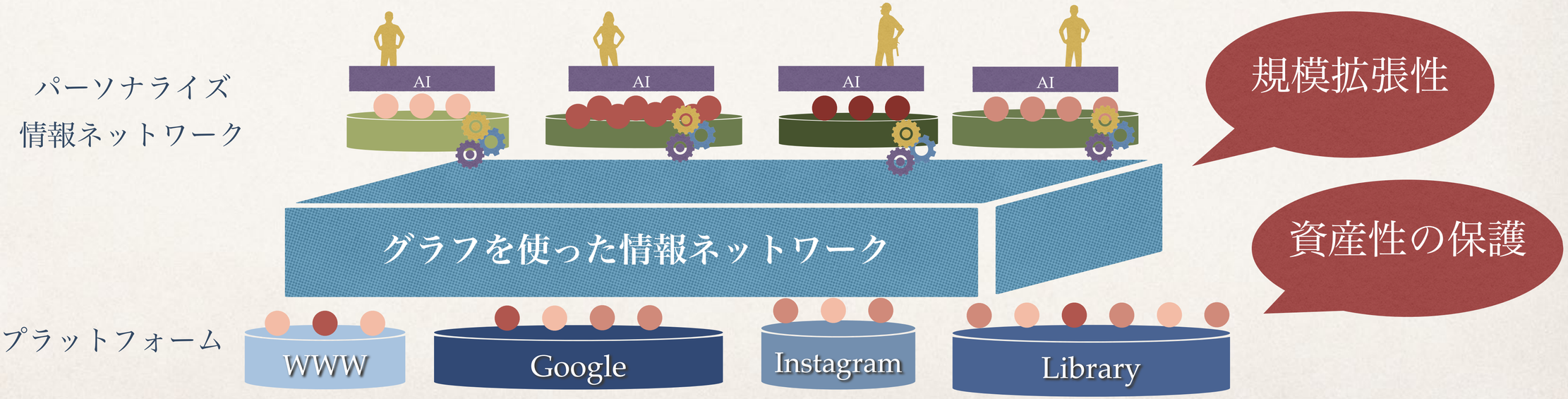
Kunitake Kaneko, Dept. Information and Computer Science, Faculty of Science and Technology / Research Institute for Digital Media and Content, Keio University, [kaneko@dmc.keio.ac.jp]

研究トピック：グラフを使った情報ネットワーク

- 情報を取り巻く現状
  - 394 ZB@2028の情報
  - 情報はプラットフォームで分断
  - 人やAIによる情報探索の限界

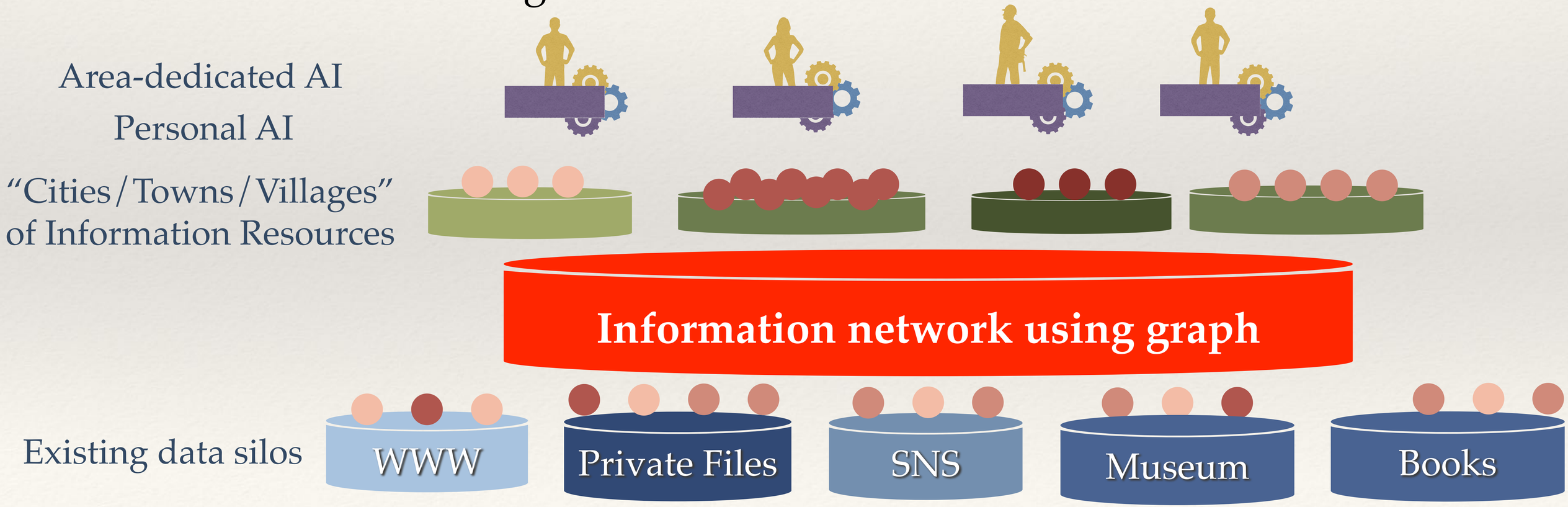
K, M, G, T, P, E, Z

- グラフを使った情報ネットワーク
  - ウソのない情報の提示
  - 大局的情報の提示
  - タイムリーな情報の提示
  - ユーザにあった情報の提示



Global information network using graph

- Global information services without compromising the information services within existing data silos



研究の進め方＆研究室の雰囲気

- 自分で考えて＆ディスカッションして研究をすすめます
- 0から1を創るタイプの研究が楽しめます
- 社会実装を目指す企業と一緒に活動しています
- 知識がなくても大丈夫（分からないことは何でも聞ける雰囲気）

留学生もいます

- 説明会 10/30(金), 11/4(水), 11/9(月)
  - なんでも聞いてください。
  - 研究室の学生と本音トークしてください

リッチな
計算環境・ネットワークが
あります

情報サービスを理解したネットワーク人材は稀少
技術寿命は長い（流行に影響されにくい）
ヨーロッパの研究者とコラボ？