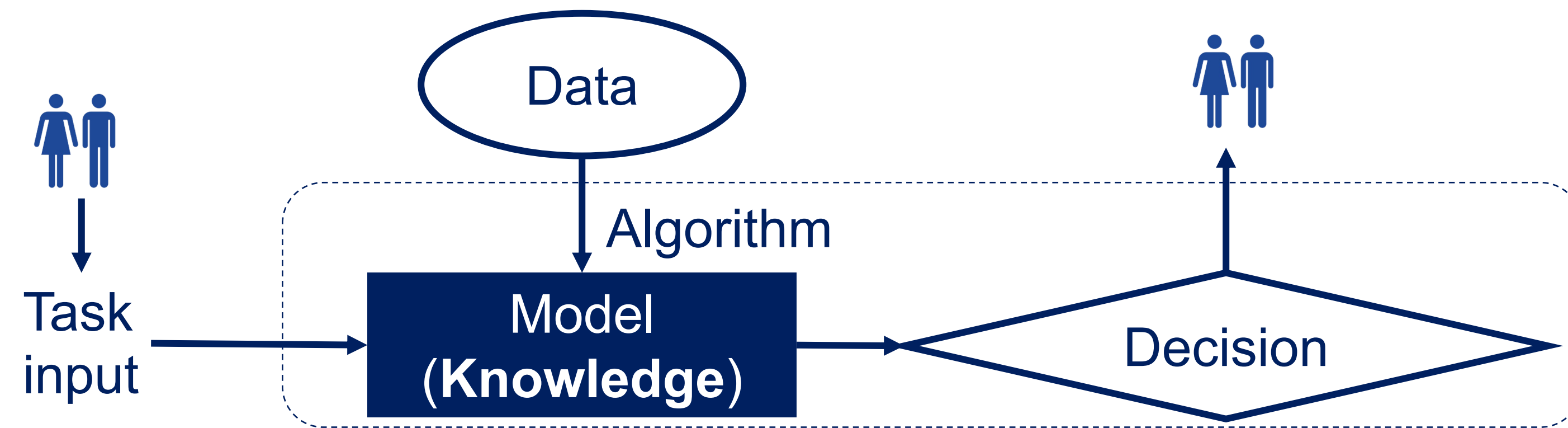# Towards Specialized Intelligent Assistance (Specialized IA)

Data Mining towards Decision Making (DM²) Lab, Computer Science and Engineering (CSE), University of Notre Dame

Mission

Discover knowledge from big data to facilitate decision making

Approaches

User (behavior) data (interactions as *graphs*)

User Model X (needs, persona)

Response $P(Y|X, K)$

Massive text data (*documents*)

Knowledge graph / Taxonomy K

Motivation and Challenges
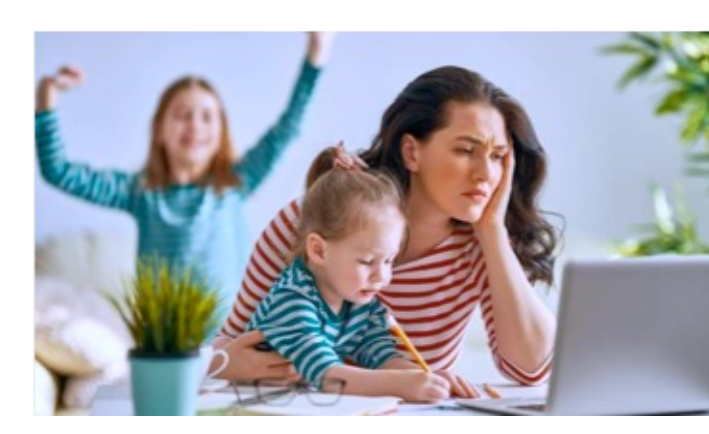
Task-specific IA

One-fits-all model

knowledge

Specialized IA: Various tasks in each domain

Tech support

Mental health
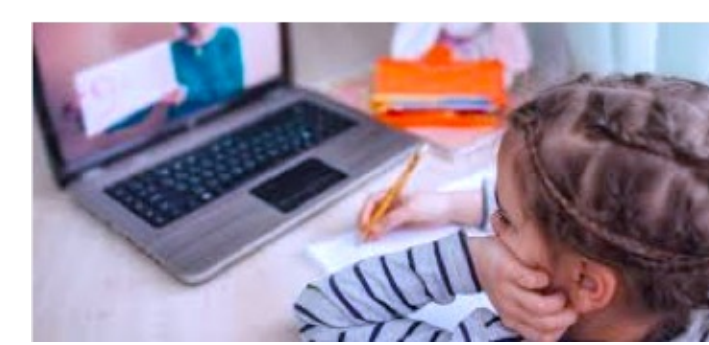
Online education

Scientific discovery

lack of knowledge

Graph Machine Learning / User Modeling

Calendar Graph Neural Networks for User Behavior Modeling (KDD'20)

Data Augmentation for Graph Neural Networks (AAAI'21)

Cross-Network Learning with Partially-Aligned GNNs (KDD'21)

Information Extraction / Knowledge Graph

Biomedical Knowledge Graph (KDD'19; EMNLP'19; BIBM'19)

Scientific Named Entity Recognition (EMNLP'20)

Taxonomy Completion via Concept Generation (KDD'21)

Research Fields and Our Team (Join us!)

Data Mining → Graph Machine Learning → User Modeling

Machine Learning → Information Extraction → Knowledge Graph

Natural Language Processing → Text Generation → Question Answering

Daheng Wang (PhD 2021)
Tong Zhao (PhD 2022; Snap Research Fellowship)
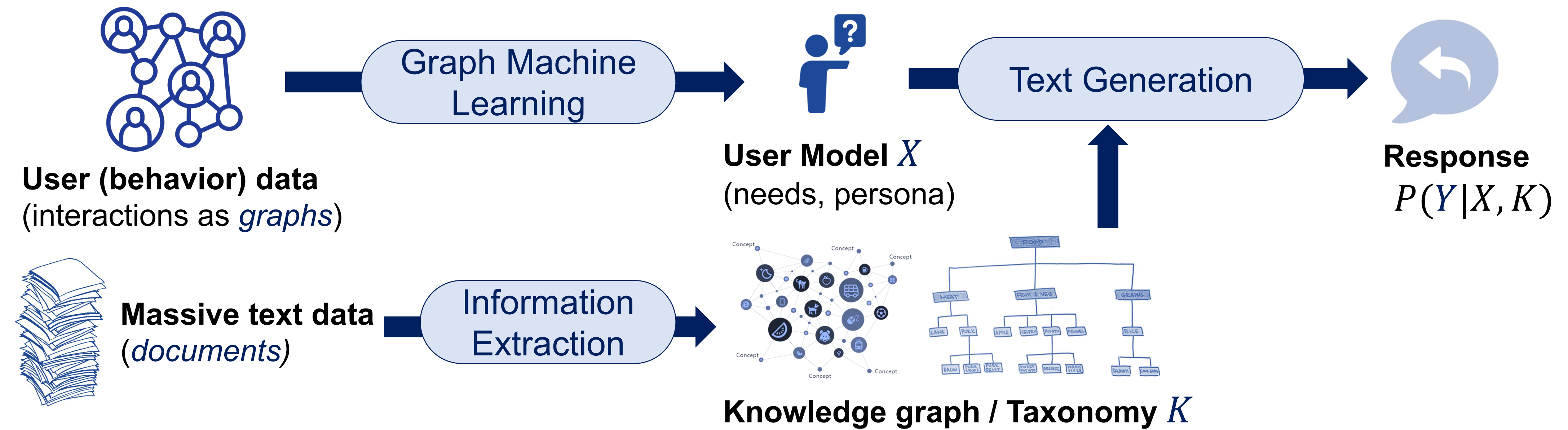Gang Liu (2021-)
Eric Inae (2022-; Dean's Fellowship)

Qingkai Zeng (2018-)
Lingbo Tong (2020-; CSE-Psych Joint PhD)
Hy Dang (2022-)

Wenhao Yu (2019-; CSE Select Fellowship)
Mengxia Yu (2020-; CSE Select Fellowship)
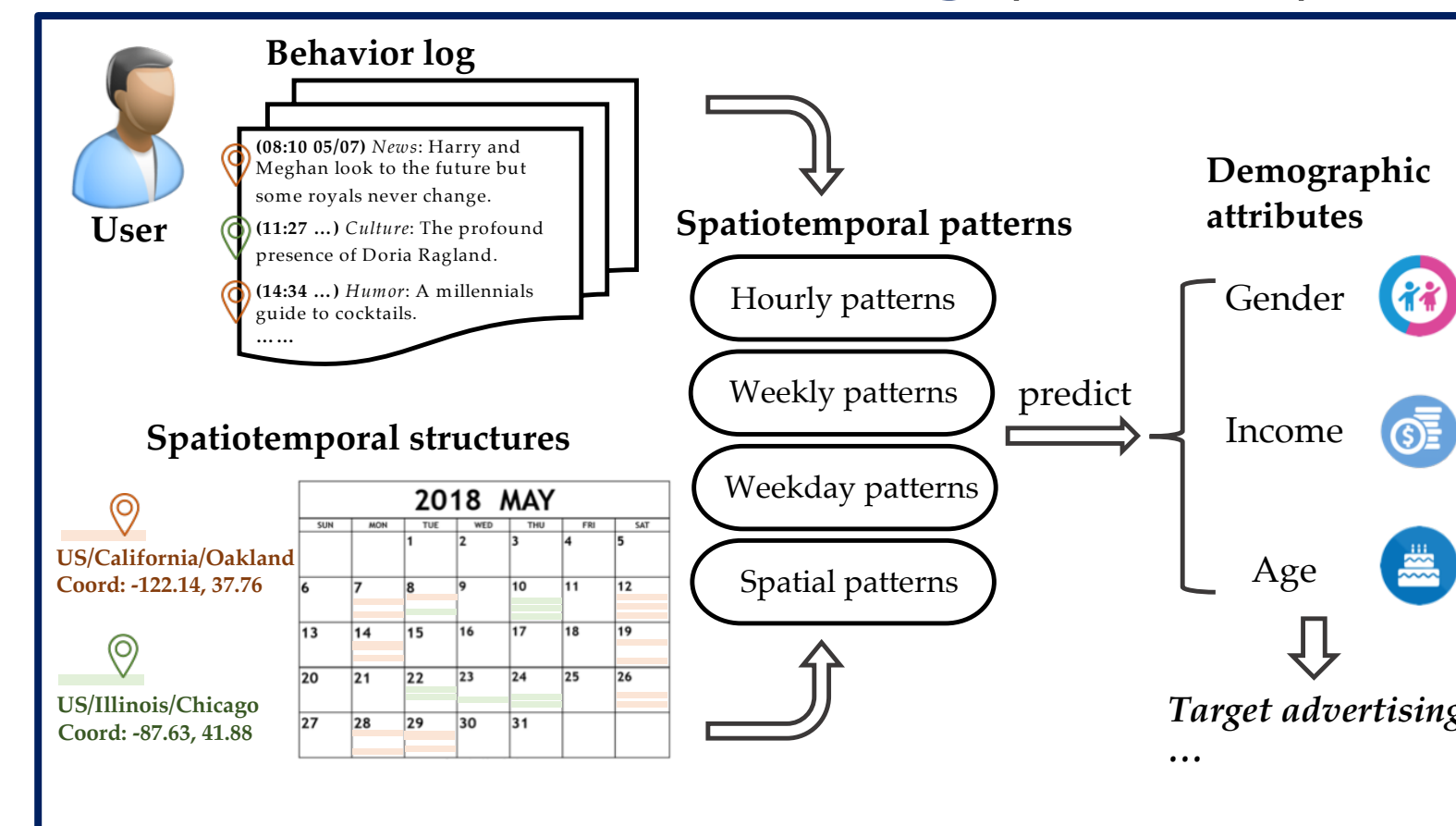Zhihan Zhang (2021-)

PI: Meng Jiang
(mjiang2@nd.edu;326C Cushing)

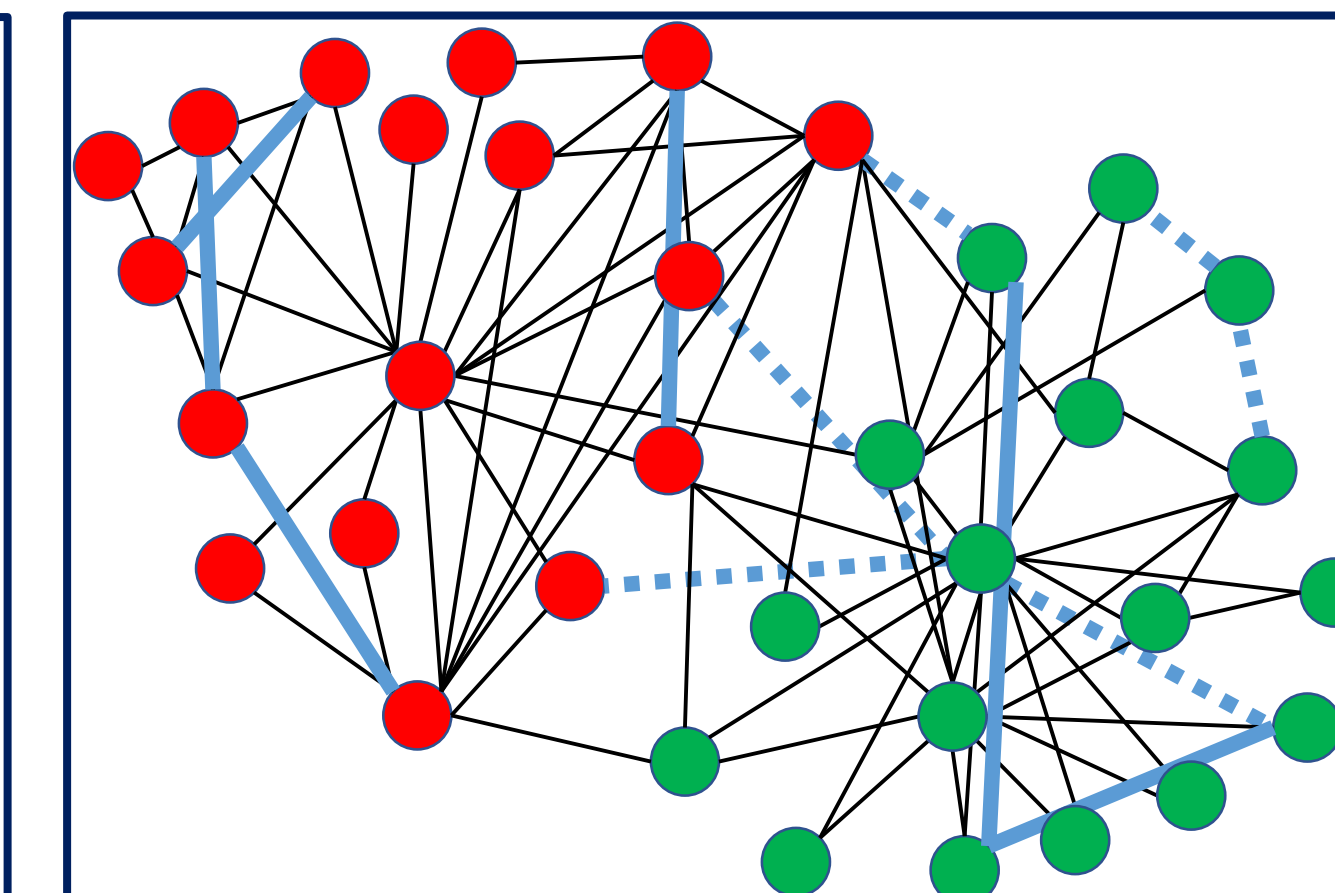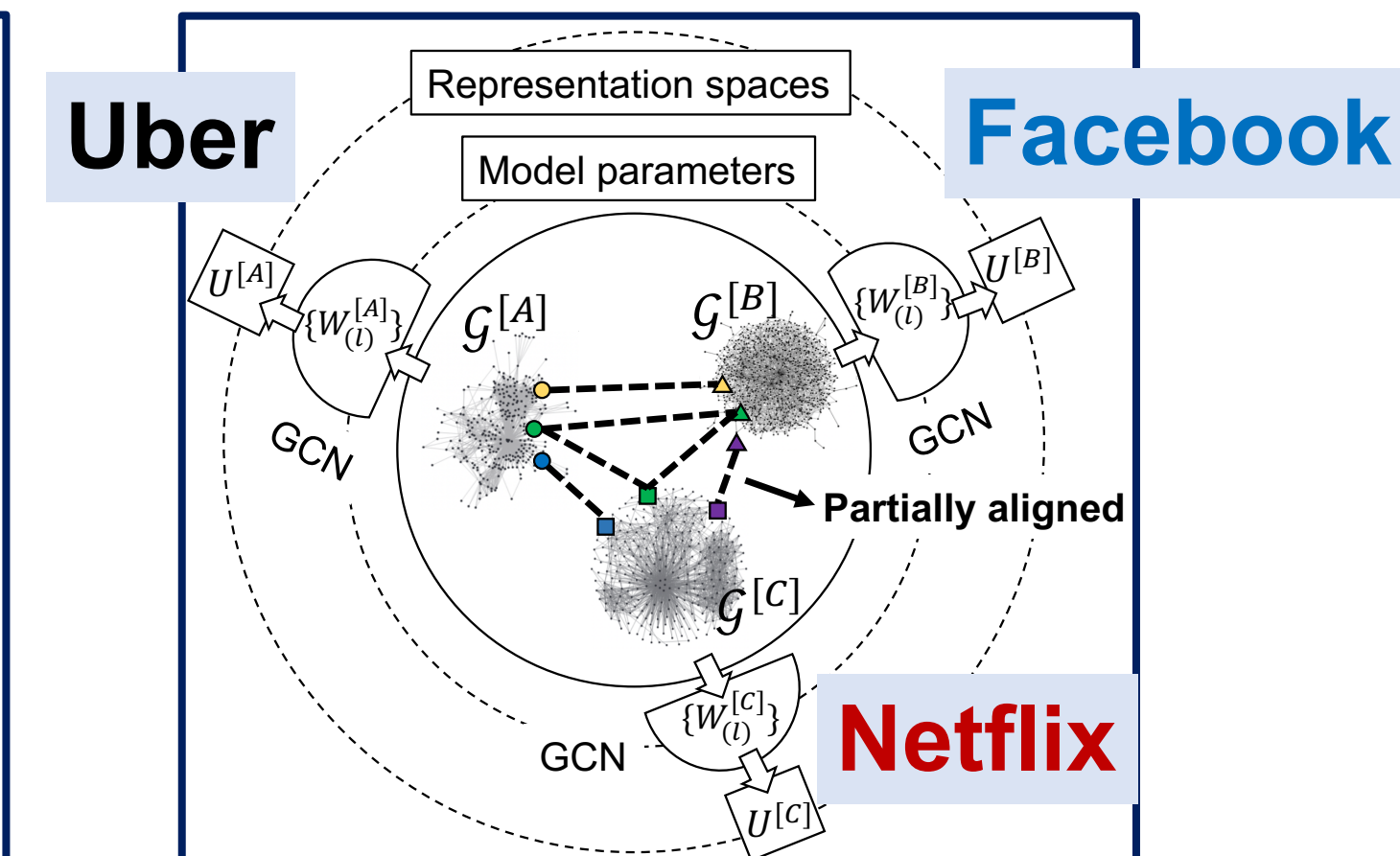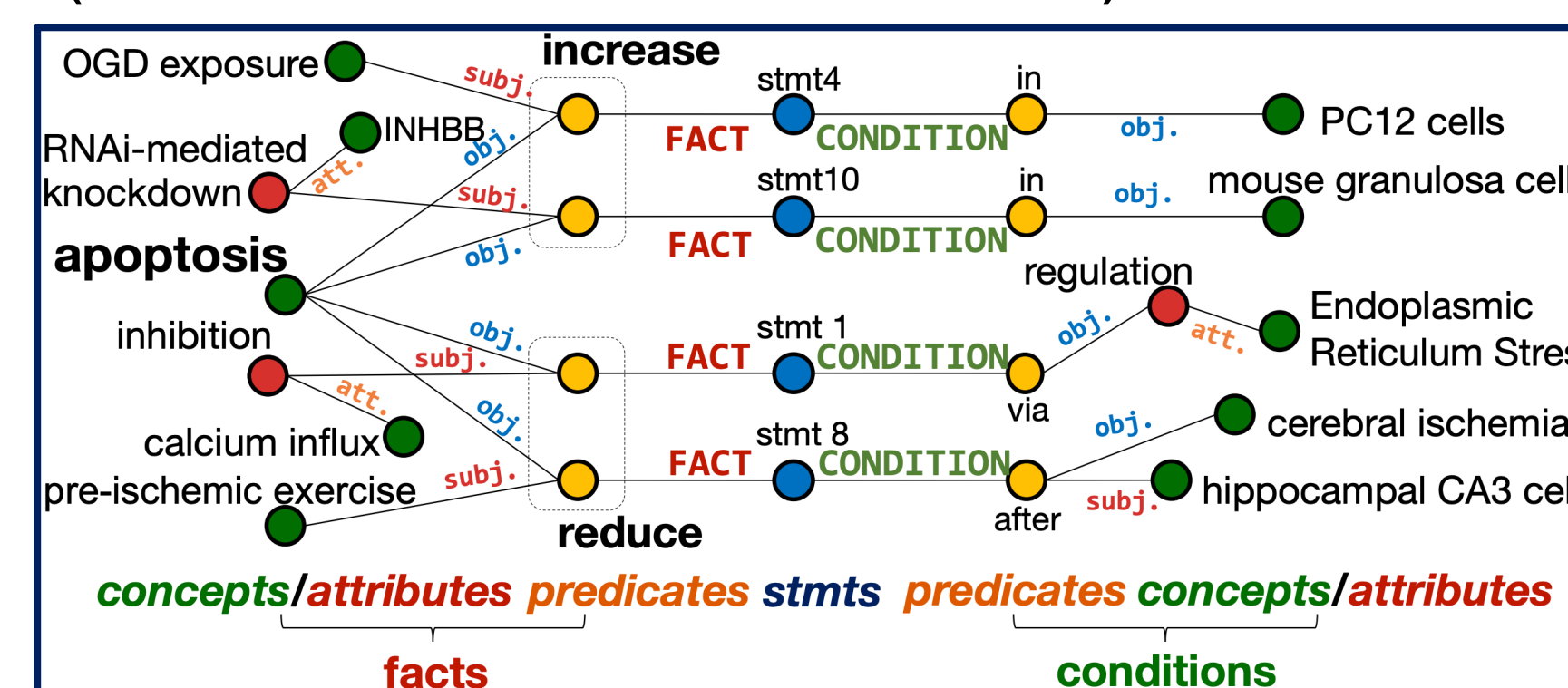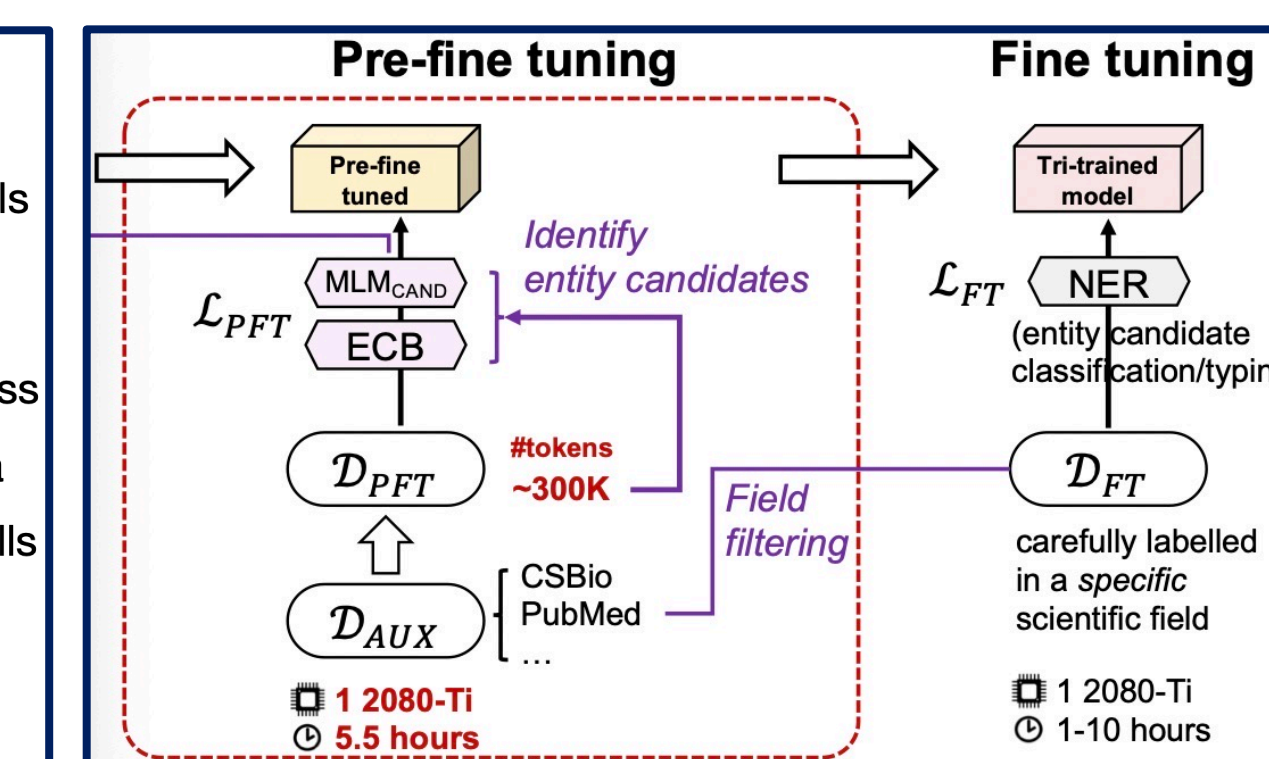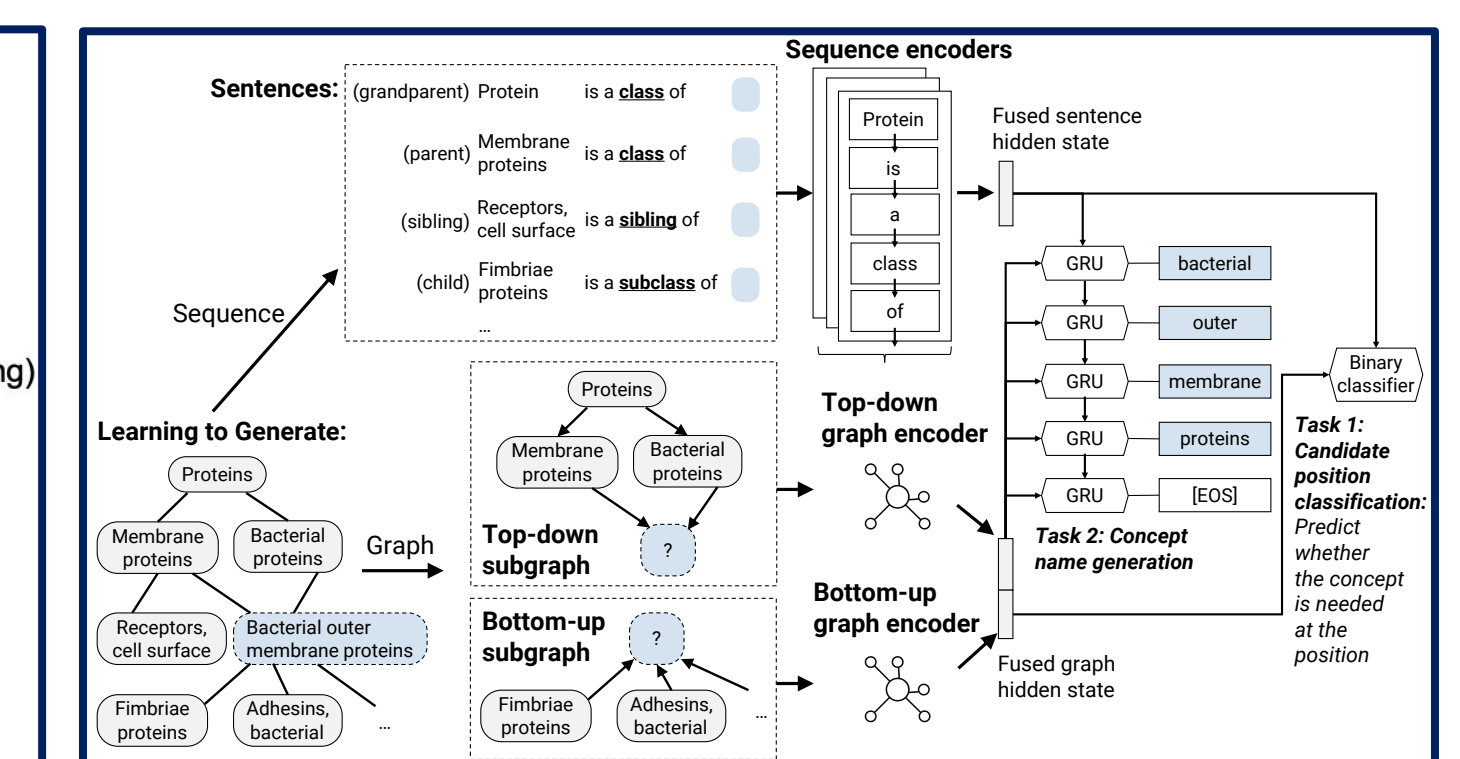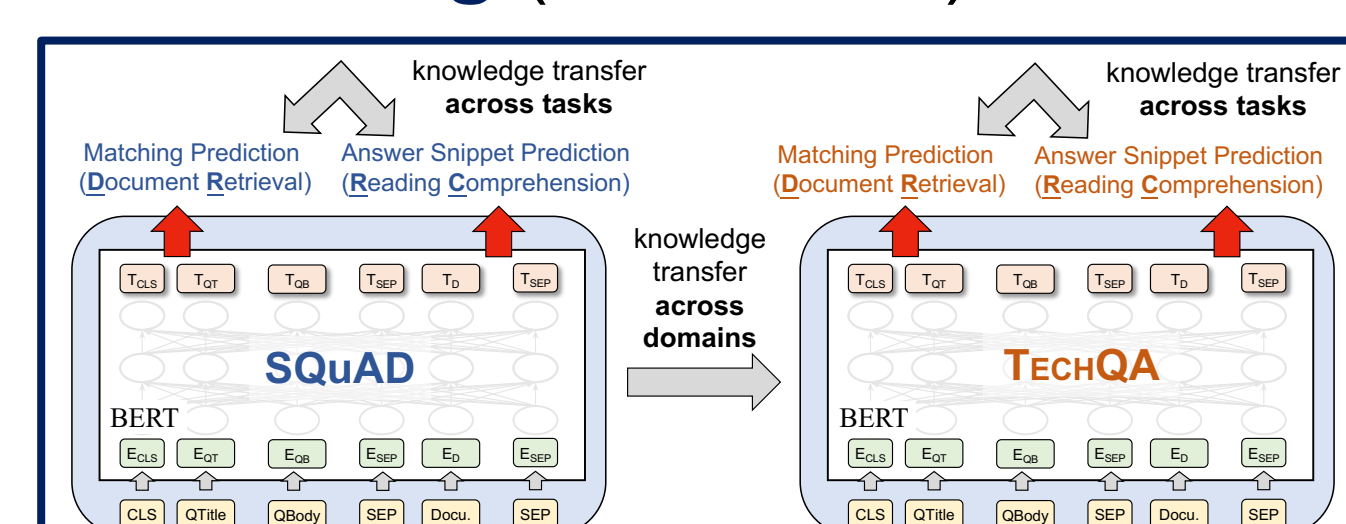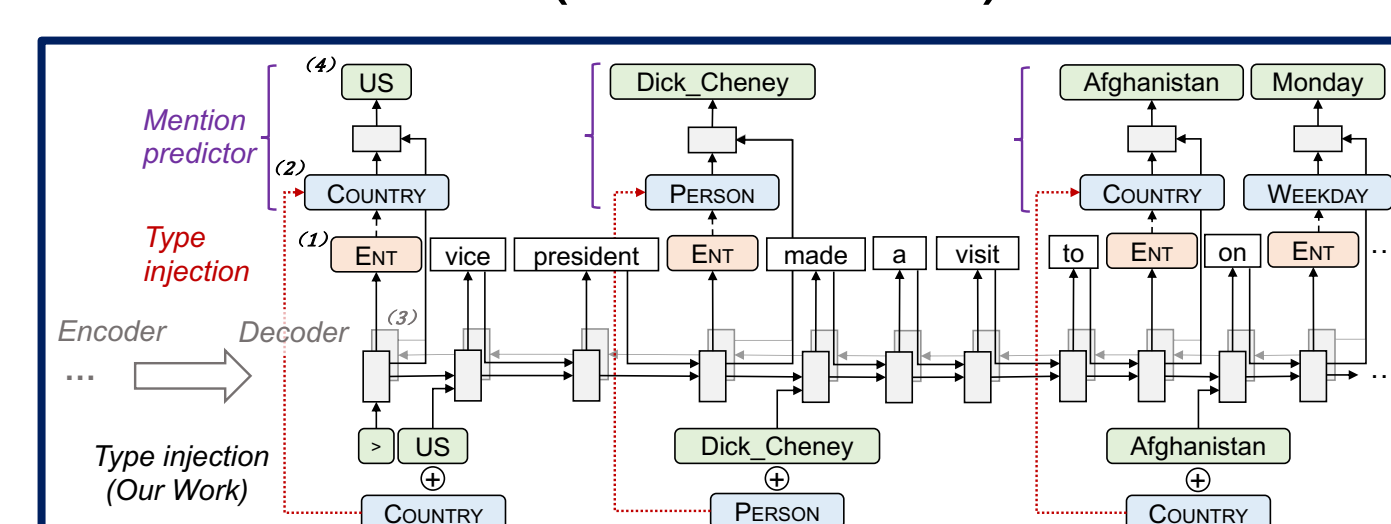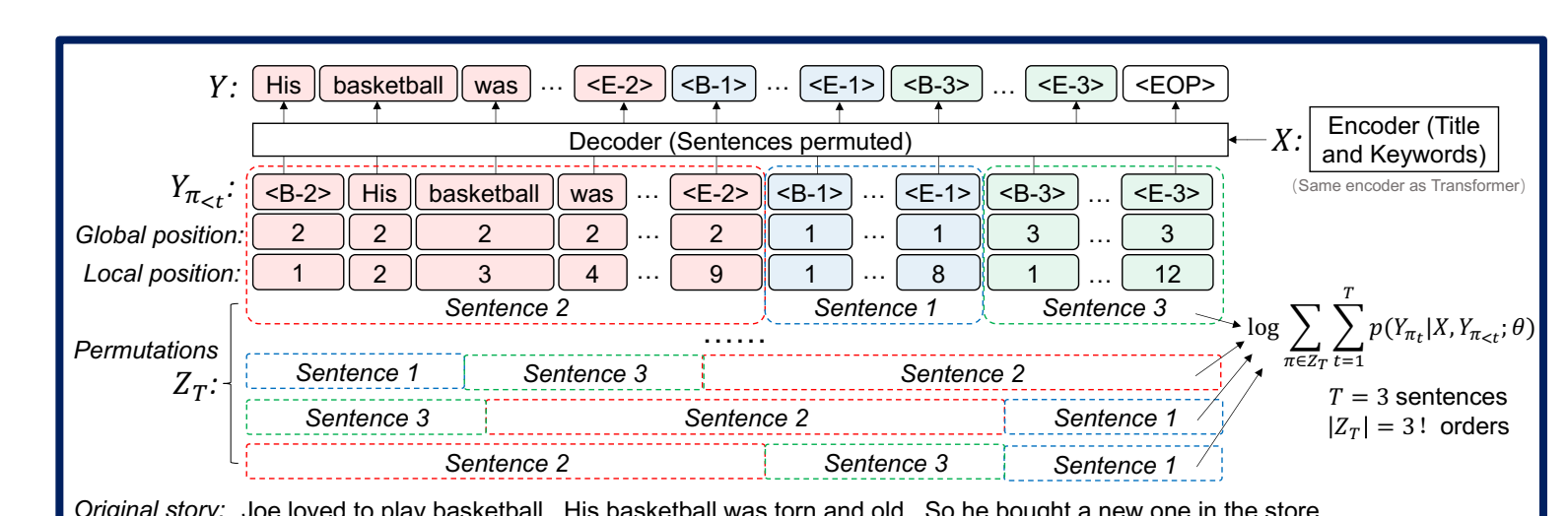## Text Generation / Question Answering

Technical Question Answering (NAACL'21)

Entity-Guided Story / News Generation (EMNLP'21)

Diversified Paragraph Generation (EMNLP'21)