Qingyang Yu

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Education

- **Stevens Institute of Technology** — Hoboken, NJ
  Ph.D. in Computer Engineering — *September 2024 - Present, Advised by Prof. Hao Wang*
  Research Interests: Generalization, Continual Learning, Federated Learning, LLM.
- **Rutgers University in New Brunswick** — Edison, NJ
  Master in Computer Science; GPA: 3.833 out of 4 — *Aug 2021 - May 2023*
  Main Courses: Algorithms, Spectrum of Graph, Complexity Analysis, Machine Learning, Artificial Intelligence.
- **University of Liverpool** — Liverpool, UK
  Bachelor of Computer Science; GPA: 4 out of 4 (Honours First-Class Degree) — *Sep 2018 - May 2020*
  Main Courses: Algorithms, Computer Networks, Calculus, Linear Algebra, Game Theory, Formal Method and Automata, HPC.

Research Experience

- **Stevens Institute of Technology** — Hoboken, NJ
  Generalization, Continual Learning, Federated Learning, Machine Learning, LLM — *October 2024 - present*
  - **Bayesian-Based Personalized Federated Continual Learning**: Developed a Bayesian personalized federated continual learning framework to model the evolution of shared global knowledge and client-specific knowledge across sequential tasks, enabling more robust learning in real-world federated environments with heterogeneous, privacy-sensitive, and continually changing data. The project is under the instruction of Prof. Hao Wang@SIT and Prof. Yang Hua@QUB.
  - **Beyond Quadratic Bowl: Change-Constrained Optimization for Forgetting in LLM (Under Review)**: Developed a continual learning framework for large language models that combines probabilistic forgetting analysis with constrained optimization to mitigate catastrophic forgetting during sequential fine-tuning, supporting more reliable real-world deployment where models must continuously adapt while retaining prior knowledge. The project is under the instruction of Prof. Hao Wang@SIT, Prof. Yang Hua@QUB, and Prof. Zining Zhu@SIT.
  - **GFedCL: Graph-Based Federated Continual Learning with Spatial and Temporal Awareness (Under Review)**: Developed a spatial-temporal-aware federated continual learning framework that uses attention-based relational graphs and generative adversarial learning to generate privacy-preserving synthetic data, improving performance on evolving, non-storable client data and supporting practical deployment in real-world settings such as healthcare with strong regional and temporal variation. The project is under the instruction of Prof. Hao Wang@SIT, Prof. Yang Hua@QUB, and Prof. Qizhen Zhang@UofT.
  - **FedIndex: Federated Domain Adaptation with Continuous Indices (Under Review)**: Developed a privacy-preserving federated domain adaptation framework for continuous domain indices, improving cross-client model adaptation without raw-data sharing for practical use in healthcare and other privacy-sensitive real-world settings. The project is under the instruction of Prof. Hao Wang@SIT and Prof. Hao Wang@RU.
- **Rutgers University** — Edison, NJ
  Algorithm, Game Theory, Machine Learning — *Aug 2021 - May 2023*
  - **Information Cascade in Sequential Decisions**: Developed a theoretical mechanism design framework for sequential urn games that incentivizes truthful signal disclosure and suppresses information cascades, offering insights for more reliable collective decision-making in sequential voting systems and financial markets. The project is under the instruction of Prof. Jie Gao@RU.
  - **The effect of latent space on GAN model**: Explore the impact of the latent space on different GAN models by using dimension reduction, vision, and clustering. The datasets are pizza datasets.
- **University of Liverpool** — Liverpool, UK
  Algorithm, Topology — *Sep 2018 - May 2020*
  - **Explore the complexity of tree height between topology knots**: Analyze the height complexity of the transformation tree generated by the sequence of Reidemeister moves required to establish equivalence between two topological knots.

Leadership/Teamwork Experience

- **Rutgers University** — Edison, NJ
  Graduate Student — *Aug 2021 - May 2023*
  - **Improved BiDAF model for NLP**: Use Twitter and wiki word vector with methods like self-attention or embedding to develop improved BiDAF and base BiDAF model to retrieve the information and features.
  - **Recommendation System**: Developed a movie recommendation system with the Surprise package, using built-in collaborative filtering methods to predict user preferences and evaluate recommendations against ground-truth interactions.
  - **Explore the latent space of I2I models**: Developed and compared multiple GAN architectures, including vanilla GAN, Pix2Pix, and CycleGAN, on an image transformation task using a pizza dataset. Applied dimensionality reduction techniques such as UMAP and computer vision methods to generate labels for input images, and analyzed clustering performance to study how latent space structure influenced transformation quality.

- **Mobile Database Application Development**: Designed and developed an Android application for SQL querying using Android Studio. Built a web-based front end embedded within the mobile app, and deployed Spring-based back-end services to the cloud. Worked with cloud infrastructure and database services, including Google Cloud compute instances and SQL data platforms, to support application hosting and query processing.

- **University of Liverpool** Liverpool, UK
  Undergraduate Student *Sep 2018 - May 2020*
  - **Modification for Minecraft**: Developed a Minecraft-based project that enabled players to teleport to beacon locations, using libraries of the de-compiler to define in-game objects andimplement object-specific behaviors, including powered machines, capacity management, and teleportation mechanics.

Additional Experiences

- **HIKVISION** Nanjing, China
  Big Data Analyzer *August 2019 - September 2019*
  - **Job Content**: Built and evaluated big data platforms, including HBP, by assessing the feasibility of Hadoop-based computing frameworks such as Spark and using Kafka to process customer data streams. Supported users by designing and assigning platform build tasks. Contributed to the development of a big data platform for the Nantong Police Office's CCTV and IoT network, aimed at collecting and processing large-scale traffic data to support traffic monitoring and control.