Tanmay Ghai

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Education

- **University of Southern California** — Los Angeles, CA
  Master of Science in Computer Science — July 2020 – Dec. 2021

  Relevant Coursework: Analysis of Algorithms, Deep Learning & its Applications, Advanced Data Stores, Applied Cryptography, Security & Privacy in Big Data, Advanced OS, Advanced Networking, **Member of '20 Viterbi Summer Honors Program (VSOP)**

- **University of California, Berkeley** — Berkeley, CA
  Bachelor of Arts in Computer Science — Aug. 2015 – May 2019

  Relevant Coursework: Data Structures, Machine Learning, Advanced Algorithms, Databases, Networking, Operating Systems, Artificial Intelligence, Discrete Math and Probability Theory, Linear Algebra, Data Science, Computer Graphics

Experience

- **Workday, Inc.** — Pleasanton, CA
  Software Development Engineer II — July 2019 – Present

  I am a software engineer contributing to Workday's Prism Analytics product on the Business Intelligence (BI) team. Formerly, I was an engineer on the ui-server team working on scalable frameworks & infrastructure for our platform where I was a SDE 1 from July 2019 – Oct. 2020 and an intern in the summers of 2017 & 2018.

  - **BI Data Services**: Working on the **Reporting & Analytics Engine**, a multi-tenanted, high performance, in-memory processing engine to service over 1 billion monthly queries, and reports, dashboards, & visualizations built on those requests.
  - **UIS**: Developed **Hubs** (a multi-step transaction processing framework), contributed to **Dovah** (a thread-level refactoring of platform level logging), and led the **VSS Streaming** initiative (a REST streaming implementation to scan millions of uploads/downloads within Workday's various endpoints).
  - **Internships**: In 2018, built **a full-stack, interactive scheduling micro-system** for team scheduling and workforce management. & in 2017, delivered a **cross stack debugging microservice** for internal developers & external users to detect errors in the platform (scaled and dealt with millions of transactions per hour).

- **ServiceNow, Inc.** — Santa Clara, CA
  Cloud Platform Development Intern — May 2016 – Aug. 2016

  - **Licensing & Usage Analytics**: Wrote scripts and generated key reports on user behavior & usage analytics using machine learning via Matlab, Kibana, and Tableau to analyze trends for over 500+ customers

Research

- **Information Sciences Institute, USC** — Los Angeles, CA
  Graduate Research Assistant – **USC D-Security**, advised by Prof. Srivatsan Ravi. — July 2020 – Present

  My research interests are in the intersection of scalable distributed computing, cyber-security, data privacy, machine learning and their applications to real-world problems. My research statement can be found here.

  - **PPER**: Working on privacy-preserving entity resolution using homomorphic encryption (HE), and threshold HE for multi-party computational settings.
  - **SHELFI**: Implementing and analyzing impact of HE encryption of model weights for privacy-preserving functionality within a secure, federated learning architecture.

Projects

- **Secure Audit System**: A decentralized, secure audit system using RSA digital signatures, AES-128 and homomorphic encryption. Write-up can be found here
- **Morse Code Decoder**: CNN-LSTM-CTC deep learning model to decipher morse code irrespective of the medium used to generate it. Experiments and results can be found here
- **Real-time N-Body Cosmological Simulation**: N-Body cosmological simulation build with WebGL and ThreeJS to depict gas clouds coalescing with each other to form galaxies. Live demo and blog can be found here.
- **Protein Structure Reconstruction**: Using FFT and backprojection, reconstructed a 3D visualization of a zika virus from a 2D image. Full write-up and experiments can be found here.

Programming Skills

- **Languages**: Java, C++, Python, JS, SQL, Scala **Technologies**: Kafka, Spring, PyTorch, Hadoop, Spark