

# TANMAY GHAI

## Software Engineer | Researcher

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 San Francisco Bay Area [my homepage](#)

I am a software engineer at [Twitter](#) and a security, distributed systems & machine learning researcher in the networking and cybersecurity division at the [Information Sciences Institute](#).

## EDUCATION

2020 – 2021 **Master of Science in Computer Science**, University of Southern California  
 2015 – 2019 **Bachelor of Arts in Computer Science**, University of California, Berkeley

## EXPERIENCE

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| May 2022<br>Present   | <b>Software Engineer II, TWITTER INC.</b> <ul style="list-style-type: none"> <li>Engineer for platform security team focused on core cryptographic and security libraries, credential lifecycle management, and internal access controls (service-to-service authN &amp; authZ).</li> <li>We control Twitter's multi-intermediate public key infrastructure, certificate management system, which scales to ~10M certificates and Twitter's secret management and distribution services which reach peak 400k RPS.</li> </ul>                                                                                                                                                                                                                                                               |
| Jan. 2022<br>Present  | <b>Researcher, INFORMATION SCIENCES INSTITUTE</b> <ul style="list-style-type: none"> <li>Researcher in the USC D-Security lab advised by Prof. <a href="#">Srivatsan Ravi</a>; continued on post my master's where I was a graduate research assistant in the same group from July 2020 – Dec. 2021.</li> <li>My (broad) research interests are in privacy-preserving technologies and secure systems, particularly at the intersection of scalable distributed computing, data privacy, and machine learning. Currently, I'm looking into privacy-preserving machine learning and secure multi-party computation.</li> </ul>                                                                                                                                                               |
| July 2019<br>May 2022 | <b>Software Engineer I – II, WORKDAY INC.</b> <ul style="list-style-type: none"> <li>Engineer and team lead for the reporting and analytics engine - a multi-tenanted, performant, in memory processing engine responsible for over 2 billion+ queries monthly. Built Cosmos - a framework for delivered analytic data sources and applications; performs 5x faster than existing RaaS reports and incremental data extraction using delta caches saves 99%+ of compute time.</li> <li>Engineer and scrum-master for the web-server infrastructure team responsible for all in/e-gress traffic into Workday. Delivered multi-step transaction processing framework for personas and a REST streaming initiative with the VSS team, scanning all uploads/download within Workday.</li> </ul> |

## PUBLICATIONS

|      |                                                                                                                                                                                                                                         |
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| 2022 | "Evaluating the Feasibility of a Provably Secure Privacy-Preserving Entity Resolution Adaptation of PPJoin using Homomorphic Encryption". arXiv, 2022. [ <a href="#">pre-print</a> ]                                                    |
| 2022 | "Secure Federated Learning for Neuroimaging". arXiv, 2022. [ <a href="#">pre-print</a> ]                                                                                                                                                |
| 2021 | "Secure neuroimaging analysis using federated learning with homomorphic encryption". In 17th International Symposium on Medical Information Processing and Analysis, volume 12088, pages 351–359. SPIE, 2021. [ <a href="#">paper</a> ] |
| 2021 | "AMPPERE: A Universal Abstract Machine for Privacy-Preserving Entity Resolution Evaluation", page 2394–2403. Association for Computing Machinery, New York, NY, USA, 2021. [ <a href="#">paper</a> ]                                    |

## AWARDS

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| 2022 | <a href="#">Viterbi Master's Student Award</a> for Best Research in the Computer Science Department. An article published to the USC Viterbi website detailing my work and award can be found <a href="#">here</a> . |
| 2020 | Member of the 2020 Cohort of the <a href="#">Viterbi Summer Honor's program</a> (VSOP).                                                                                                                              |
| 2018 | Awarded UC Berkeley's <a href="#">Dean's List</a> for the College of Letters & Sciences in the Spring 2018 semester.                                                                                                 |

## SKILLS

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|------------------------|-------------------------------------------------------------------------|
| <b>Programming</b>     | Python, Java, Scala, C/C++                                              |
| <b>Frameworks</b>      | Spring, Kafka, Bazel, Spark/HDFS, PyTorch, Aurora/Mesos, Tomcat, Docker |
| <b>Data Stores</b>     | MySQL, MongoDB, BigQuery, Manhattan                                     |
| <b>Other Libraries</b> | PALISADE, SEAL, KGTK                                                    |