Casey Meehan

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Publications

- **Sentence-level Privacy for Document Embeddings** — ACL 2022
  Novel mechanism offering pure local DP at the sentence level for documents
- **Privacy of Generalized Shuffling** — ICLR 2022
  Formalizing a non-DP privacy notion offered by general shuffling distributions
- **Location Trace Privacy Under Conditional Priors** — AISTATS, 2021
  How to sanitize a sequence of highly correlated locations from a single user — *blog post*
- **A Non-Parametric Test to Detect Data-Copying in Generative Models** — AISTATS, 2020
  Exploring what constitutes 'overfitting' in generative models and how to detect it — *blog post*
- **Privacy Amplification by Subsampling in the Time Domain** — ICML TPDP, 2021
  Time-domain subsampling benefits the privacy/utility tradeoff for temporal aggregate data

Education

- **University of California, San Diego** — La Jolla, CA
  PhD Student studying machine learning privacy & methods — *Fourth Year*
  - **Sentence-level local privacy** Proposed the new, strong privacy definition of Sentence DP. Developed Tukey median based mechanism for generating sentence-private embeddings of documents.
  - **Non-Uniform Shuffling for Local Privacy:** Formalized how shuffling of private data prevents inferential threats e.g. correlation attacks. Proposed novel non-uniform shuffling mechanism that blocks such attacks while enabling trend-learning not available to uniform shuffling.
  - **Local Privacy for Location Traces:** Local privacy framework for sequences of highly dependent data, accentuating the balance between utility and realistic dependence. Developed SDP for optimizing covariance of added noise to thwart inference of any Gaussain process adversary.
  - **Nonparametric Hypothesis Test for Evaluating Generative Models:** Developed novel hypothesis testing framework for evaluating the generalization of generative models along with an efficient test statistic. Results are promising for KDEs, VAEs, and GANs.
  - **Organizer for NeurIPS privacy workshops 2019/20/21** Helped coordinate and/or AC multiple of NeurIPS' privacy workshops, which has been a fantastic opportunity to connect and engage with the ML privacy community on a personal level.
- **Harvard University** — Cambridge, MA
  M.S. Computational Science & Engineering (Applied Math & CS) — *Aug 2017 – May 2018*
- **Brown University** — Providence, RI
  Bachelor of Science in Electrical Eng. & Signal Processing — *Aug. 2011 – May 2015*
  - **Brown Space Engineering** lead a group of undergraduate engineers in designing/launching Brown's first satellite

Experience

- **Facebook AI Research** — San Francisco, CA
  Research intern investigating reconstruction attacks on large ML models. — *Summer 2022*
- **Tesla Motors** — Palo Alto, CA
  Sensing Algorithms Intern — *Summer 2018*
- **Analog Devices** — Norwood, MA
  Analog ASIC Designer — *Aug 2015 - Aug 2017*
  - **Ultra Low Power $\Delta\Sigma$-ADC:** Design, simulation, and layout of high-precision acoustic noise cancellation codec – lowest power in its class. Currently in production for multiple brands of noise-cancelling products.
- **Jet Propulsion Laboratory** — Pasadena, CA
  Small Satellite Group — *Summer 2012 and 2013*
  - **Orbital Analysis:** Developed simulation and feasibility analysis of sun-synchronous 8-satellite imaging constellation.
- **Other things:** surfing, cooking, short fiction