Uthaipon “Tao” Tantipongpipat

Data Scientist / Machine Learning Researcher

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**SUMMARY**

Data Scientist and machine learning researcher with 5-year industry experience after a Theoretical Computer Science PhD. Led a team on ML development by planning and executing quarterly milestones in LLM and ranking and recommendation systems. Has driven successful cross-functional projects (resulting in 3+ billions press click-read) and impacted engineers by applying research to set company-wide metrics. Track record (10+) of top-tier peer-reviewed publications in ML, algorithms, and statistics, with emphasis on algorithms, ML fairness and privacy, and optimization.

**EXPERIENCE**

**Agoda, Bangkok, Thailand** *- Lead Data Scientist* Jan 2023 - Now

**Front-end LLM**

* Led quarterly planning across Product and Engineering; owned and drove the design of the LLM agentic flow in collaboration with C-level stakeholders. Applied internal causal inference tools based on counterfactual analysis to estimate $3M in annual profit and $3M in annual loyalty value from initiatives under my leadership.
* Discovered and led LLM security enhancement project, identifying and resolving prompt leak vulnerabilities while improving model performance (-3% hallucination rate). Proactively discovered upcoming modeling issues and fixed to get $360k annual value impact instead of -500k.
* Drove supply data analysis resulting in 9% chatbot answer uplift, translating to 30k bookings or $550k total value annually ($300k margin and $250k loyalty value).
* Spearheaded and aligned automated LLM evaluation framework, improving mean F1 score from 66% to 87% and isolating a 15% ambiguous user segment, enhancing labeling clarity and discovering new behavioral insights.

**Ranking**

* Implemented and optimized TensorFlow Decision Forest model, and transformed and optimized RNN with attention dataset, improving offline validation metrics by 1-2%.
* Originated and led loyalty-personalized ranking via user-specific parameter; additionally reduced MSE by 50% for loyalty and profit prediction through a new statistical model to support ranking optimization.
* Designed, optimized, and maintained Scala Spark data pipelines with resource-efficient architectures.
* Built a CTR model, reducing RMSE by 75%, to support revenue optimization for the advertising team.

**Researcher (contractor), remote** *- Human Rights Data Analysis Group and Carnegie Mellon University* May 2024 - Now

* Analyze the impact of different covariate combinations on racial disparities in recidivism risk assessment models and examine heterogeneity in covariate effects across sites.

**Twitter (now X), remote US** *- Machine Learning Researcher* Jun 2020 - Jan 2023

* Led Twitter’s image cropping algorithmic bias audit resulting in a published academic paper and $1.5M press ad equivalency and 3B readership from 500 news articles in 49 countries. Further follow-up work by team members resulted in additional $1.4M, 2.7B reads, and 800 articles from 47 additional countries, and contributed to the decision to remove the algorithm in production.
* Proposed a 13-18% precision-recall video classification model improvement with no additional cost to partnering team to fix offensive misclassifications on Tweet topic annotations and discovered correlation bias with demographics despite a lack of private individual data.
* Established a data-driven guideline for company-wide engineers to adopt an inequality metric in A/B statistical testing and got business approval from leadership to finally deploy the metric.
* Published two papers in a social computing conference and one in a data science journal.

**Microsoft, Redmond WA** *- Research Intern* May 2019 - July 2019

* Implemented privacy guarantee on large-scale natural language processing models (RNNs and LSTMs) to protect against personal deidentification due to model usage. Led to a NeusIPS paper.
* Researched private correlation clustering algorithm, private submodular optimization, and surveyed literature for private stochastic gradient descent for training deep models.

**EDUCATION**

**Georgia Institute of Technology, Atlanta GA** Aug 2016 - May 2020*PhD in Algorithms, Combinatorics, and Optimization, School of Computer Science. Outstanding (Best) Student. GPA 4/4*

**University of Richmond, Richmond VA** Aug 2012 - May 2016*BS in Mathematics, with Thesis (Algebraic Combinatorics). Merit-based full-ride scholarship. GPA 3.97/4*

**University of Oxford, Oxford UK** Oct 2014 - Jun 2015*Study Abroad Program in Mathematics and Computer Science. First Class (A+ equivalent).*

**SELECTED PUBLICATIONS**

* Measuring Disparate Outcomes of Content Recommendation Algorithms with Distributional Inequality Metrics Patterns Journal 2022
* Image Cropping on Twitter: Fairness Metrics, their Limitations, and the Importance of Representation, Design, and Agency CSCW 2021
* Fast and Memory Efficient Differentially Private-SGD via JL Projections NeurIPS 2021
* Differentially Private Mixed-Type Data Generation for Unsupervised Learning IISA 2021
* The Price of Fair PCA: One Extra Dimension NeurIPS 2018

See Google Scholar <https://scholar.google.co.th/citations?hl=th&user=nzO_5FMAAAAJ> for the full list.

**SELECTED AWARDS**

* **Impact Recognition** Award, CSCW (the social computing conference) 2021
* **Best Reviewer** (top 10%) of NeurIPS (top-tier machine learning conference) 2019
* **1st Prize** and **People’s Choice**, The Unlinkable Data Challenge, NIST, US Department of Commerce 2018
* **Honorable Mention** (top 2.5%), William Lowell Putnam Mathematical Competition 2015
* **Bronze Medal and Honorable Mention**, Asia-Pacific Mathematics Olympiad (APMO) 2010, 2011
* **Gold Medal and Bronze Medal,** IWYMIC International Mathematics Competition2008, 2009
* **Two Gold Medal**, Thailand National Mathematical Olympiad 2008, 2009

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**SKILLS**

**Technical:** Python (pandas, numpy, scipy, sklearn), Scala, PySpark, Scala Spark, SQL (BigQuery, Impala), Java, C++, Tensorflow, PyTorch, Kubeflow, Hadoop/Vast, Git, GCP, Superset, Grafana, Mathematica

**Languages:** Thai (native); English (full proficiency)