

Yingtao Tian

E-mail: alan.yt.tian@gmail.com

EXPERIENCE	Google DeepMind (formerly Google Brain) Research Scientist Research on generative models and more (see projects and publications)	2019 - Now
	Internships Google Brain, Facebook, Google, Microsoft Research Asia.	Periodically 2013 - 2018
EDUCATION	State University of New York at Stony Brook, New York, U.S. Ph.D, Computer Science. Advisor: Prof. Steven Skiena	2014 - 2019
	Fudan University, Shanghai, China. B.Sc., Computer Science and Technology	2010 - 2014

MAJOR PUBLICATIONS In my research I aim at combining **computational approach**, with generative/creative settings with artists, culture, humanities and designer’s consideration, in a way that the considerations are met while machine learning can help boosting the performances. To do so, I propose following techniques and tools that have both addressed the needs in creative settings and *advances in core machine learning*. See more details in my research statement https://alantian.net/research_statement.pdf.

(1) Generating Artifacts with Artistical Discretion: Co-design of generating algorithm and generating algorithm is needed to exercise such discretion. In my work ES-CLIP and ES-3D I design one particular abstract art form, framing as synthesizing painting by placing semi-transparent triangles respectively on 2D canvas and 3D space. In my work Simultaneous Multiple-Prompt I designed a fully end-to-end differential approach that can make any text-to-image models adapting to multiple text prompts coherently. In our work Evolving Collective AI we bridge biological collective intelligence with artificial intelligence, by constructing designs of agents inspired by the biological ants

ES-CLIP: Modern Evolution Strategies for Creativity: Fitting Concrete Images and Abstract Concepts. *Yingtao Tian, David Ha. In the Proceedings of the The 11th International Conference on Artificial Intelligence in Music, Sound, Art and Design (EvoMUSART) 2022.*

ES-3D: Evolving Three Dimension (3D) Abstract Art: Fitting Concepts by Language. *Yingtao Tian Working paper*

Simultaneous Multiple-Prompt: Simultaneous Multiple-Prompt Guided Generation Using Differentiable Optimal Transport. *Yingtao Tian, David Ha, Marco Cuturi. In the Proceedings of the twelfth International Conference on Computational Creativity, ICC3'22*

Evolving Collective AI: Evolving Collective AI: Simulation of Ants Communicating via Chemicals. *Ryosuke Takata, Yujin Tang, Yingtao Tian, Norihiro Maruyama, Hiroki Kojima, Takashi Ikegami. The 2023 Conference on Artificial Life*

(2) Machine learning-Boosted Tools for Historical and Cultural works: We encounter a lot of works related to historical and cultural aspects where faithful adherence to a few paradigms is a must. My work KaoKore and ARC Ukiyo-e Face organize facial expression images from 14-16 century and 17-19 century Japanese artworks and enable computational analysis to such artworks. Our work MingOfficial proposes LLMs and GNNs to learn representations from structured data and raw historical record, enabling identifying historical figures with interesting traits. We also, in our work Digital Typhoon, organize the longest consecutive typhoon satellite image dataset in modern history

to help weather prediction. Furthermore, by designing proper diffusion models, I propose DiffCJK to generate glyphs of new calligraphy and typology styles for hundreds of thousands CJK characters.

KaoKore: KaoKore: A Pre-modern Japanese Art Facial Expression Dataset. *Yingtao Tian, Chikahiko Suzuki, Tarin Clanuwat, Mikel Bober-Irizar, Alex Lamb, Asanobu Kitamoto. In the Proceedings of the Eleventh International Conference on Computational Creativity, ICCV'20*

ARC Ukiyo-e Face: Ukiyo-e Analysis and Creativity with Attribute and Geometry Annotation. *Yingtao Tian, Tarin Clanuwat, Chikahiko Suzuki, Asanobu Kitamoto. In the Proceedings of the Eleventh International Conference on Computational Creativity, ICCV'21*

MingOfficial: MingOfficial: A Ming Official Career Dataset and a Historical Context-Aware Representation Learning Framework You-Jun Chen, Hsin-Yi Hsieh, Yu Tung Lin, *Yingtao Tian*, Bert Chan, Yu-Sin Liu, Yi-Hsuan Lin, Richard Tzong-Han Tsai. *The 2023 Conference on Empirical Methods in Natural Language Processing (EMNLP 2023)*

Digital Typhoon: Digital Typhoon: Long-term Satellite Image Dataset for the Spatio-Temporal Modeling of Tropical Cyclones. Asanobu Kitamoto, Jared Hwang, Bastien Vuillod, Lucas Gautier, *Yingtao Tian*, Tarin Clanuwat. *Thirty-seventh Conference on Neural Information Processing (NeurIPS 2023) Systems Datasets and Benchmarks Track*

DiffCJK: DiffCJK: Conditional Diffusion Model for High-Quality and Wide-coverage CJK Character Generation. *Yingtao Tian International Conference on Computational Creativity (ICCC) 2024*

(3) Advancing Machine Learning Techniques: The advances in the creative models cannot be without advances in core machine learning research. Many works concern evolution strategy, an gradient-free optimization technique other than the more commonly used gradient based methods. We propose the EvoJAX, a scalable, general purpose, hardware-accelerated neuroevolution toolkit; NeuroEvoBench, a new benchmark of evolutionary optimization methods for Deep Learning and meta-learned tasks. We further extend evolution strategy with LLM: EvoLLM implements a type of black-box recombination operator using LLM through Evolution, and EvoTransformer flexibly characterizes a family of evolution strategies with Transformer architecture. Some work also concerns reinforcement learning: In our work DEIR we propose a theoretically-backend intrinsic reward from conditional mutual information to quickly learn policies.

EvoJAX: EvoJAX: Hardware-Accelerated Neuroevolution Yujin Tang, *Yingtao Tian*, David Ha. *In the Proceedings of the Genetic and Evolutionary Computation Conference (GECCO) 2022*

NeuroEvoBench NeuroEvoBench: Benchmarking Neuroevolution for Large-Scale Machine Learning Applications. Robert Tjarko Lange, Yujin Tang, *Yingtao Tian. Thirty-seventh Conference on Neural Information Processing (NeurIPS 2023) Systems Datasets and Benchmarks Track*

EvoLLM: Large Language Models As Evolution Strategies. Robert Tjarko Lange, *Yingtao Tian*, Yujin Tang. *The Genetic and Evolutionary Computation Conference (GECCO) 2024*

EvoTransformer: Evolution Transformer: In-Context Evolutionary Optimization. Robert Tjarko Lange, *Yingtao Tian*, Yujin Tang. *The Genetic and Evolutionary Computation Conference (GECCO) 2024*

DIER: DEIR: Efficient and Robust Exploration through Discriminative-Model-Based Episodic Intrinsic Rewards. Shanchuan Wan, Yujin Tang, *Yingtao Tian*, Tomoyuki Kaneko. *In the Proceedings of the 32nd International Joint Conference on Artificial Intelligence, IJCAI-23*

(OLD) AWARDS **27th place**, 35th Annual World Final of the ACM-ICPC, 2011

IN **Gold Medal**, ACM-ICPC Asia Chengdu Regional Contest, 2011

COMPETITIVE

PROGRAMMING **Championship and Gold medal**, ACM-ICPC Asia Amritapri Regional Contest, 2010