

# Bram Wallace

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[Google Scholar](#)

## Education

**PhD in Applied Mathematics (Aug 2017 - Dec 2021: Cornell University)**

Thesis: *Approaches to Maximize the Benefits of Pretraining in Computer Vision*

Focus: Self-Supervised/Transfer Learning in Computer Vision

**B.S. in Mathematical Sciences (2015: University of California, Santa Barbara)**

## Research Summary

By uncovering and analyzing the hidden capabilities and properties of pretrained neural networks we can gain insights that can be leveraged in a variety of ways. During my PhD, I focused on pre-trained classifiers or self-supervised networks. Now I've turned this focus to generative models, focusing on how we can expand the generation and editing abilities of text-to-image networks both from inference and training perspectives. I currently lead the internal large-scale training of text-to-image models at Salesforce AI.

## Selected Publications

**Wallace, Gokul, Ermon, & Naik.** *End-to-End Diffusion Latent Optimization Improves Classifier Guidance.*

Arxiv 2023

**Wallace, Gokul, & Naik:** *EDICT: Exact Diffusion Inversion via Coupled Transformations.*  
CVPR 2023

**Wallace & Hariharan:** *Extending and Analyzing Self-Supervised Learning Across Domains.*  
ECCV 2020

**Wallace & Hariharan:** *Few-Shot Generalization for Single-Image 3D Reconstruction via Priors*

ICCV 2019

**Reviewer:** CVPR, ICCV, NeurIPS, ICML, AAAI

## Select Work Experience

**Research Scientist (Salesforce AI) [Jan 2022 - Present]**

Currently leading the development and training of internal text-to-image models. Wrote a vision-language pretraining library in Pytorch/XLA for flexible large-scale training on TPUs. Creating novel image editing and generative algorithms to expand the capabilities of pretrained diffusion models (see Publications). Mentored AI resident and summer intern. Hosted APIs to serve image generation/editing for use in demos and hackathons. Assisted with Language Modeling for Protein Generation.

**Research Intern (Salesforce Research) [May 2021 - August 2021]**

Designed methods for self-supervised ensembling of pretrained visual recognition networks with applications to transfer learning.

**Financial Engineering Intern (Bloomberg LP) [May 2018 - August 2018]**

Developed unsupervised anomaly detection models for foreign currency exchange volatilities. This work was incorporated in Bloomberg production code and subsequently applied to other volatility surface types (e.g. commodities) with positive results.

**Teaching Assistant (Cornell University) [August 2017 - May 2019]**

Head TA of Introduction to Data Science. Awarded *Distinguished Active Learning Teaching Assistant Fellowship*. Designed and led active learning workshops for other TAs.

**Data Science and Software Engineering Intern (Vium) [April 2016 - March 2017]**

**Sports Analytics Writer (The Stats Zone) [April 2016 - August 2016]**

**Junior Researcher (UC Santa Barbara) [June 2015 - September 2015]**

**College Statistics Tutor (Self-Employed) [January 2011 - December 2011]**

## Software Skills

- Python: Pytorch(/XLA), Torchvision, Diffusers, Gradio, Transformers
- TPU (Tensor Process Unit) large-scale training
- Misc.: Linux/Bash, GCloud/Kubernetes, REST APIs for model serving

## Personal Interests

Trail running, backpacking, strategy games, river tubing, health/nutrition, reading, maps