

# [Artinity] Research Machine Learning/Computer Vision Intern

## In a nutshell

We're an early-stage startup working on the future of art.

If you are seeking a fast-iterative and challenging environment where you can be a principal element that drives innovation, not only by applying existing state-of-the-art research, but also by proposing your own solution to a real-world problem, and provide visible benefit to art lovers, this is your opportunity. Contact us!

## About us

Artinity asks a question: What would the great artists who disappeared create today?

To answer that question, Artinity is forming a team of talented data scientists and curators who explore together the relationships between the character of artists, their techniques and their era.

Thanks to the advances in Computer Vision and Artificial Intelligence research, we design and train a unique Deep Learning model for each of the disappeared artists, capable of creating new, original and faithful pieces.

This AI is individual. It exists only under the exclusive license granted by heirs and rights management agencies and is intended to produce a limited, pre-defined number of posthumous creations.

These digital works are authenticated by means of NFT (Non Fungible Token) to be proposed to collectors around the world by the biggest auction houses.

## Your mission

We leverage generative modeling to synthesize tasks such as creating a new original piece of art.

You will participate in **designing our product which is based on an evolving Generative Model**, by:

- Studying and analyzing the recent advances of Generative Adversarial Networks: we believe that tinkering with hyper-parameters is no longer important nowadays. Bringing recent research to the real-world is much more valuable
- Collaborate with ML Scientists/Engineers to choose, adjust and adapt the most appropriate NN architectures and the right tools
- Collaborating with curators to improve the quality of the proposed models that best fit our use case: using their experience and knowledge to feed the product roadmap
- Preparing the evaluation benchmark: set up the right metrics
- Designing, monitoring, evaluating and maintaining our Computer Vision / Machine Learning project

Don't hesitate to reach out so we can tell you about our product roadmaps!

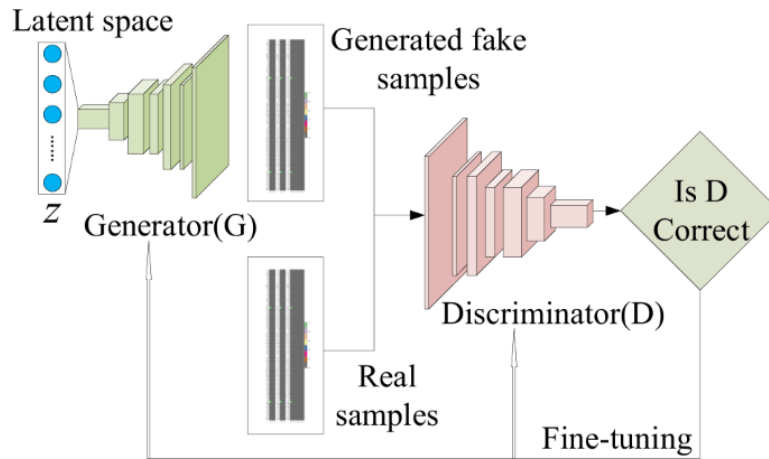
### **Brief State-Of-The-Art**

Recently, generative modeling, opened a new hope in the areas of image synthesis and unsupervised learning. Undoubtedly, Generative Adversarial Networks (GAN) presented by Goodfellow et al. [1] is the most interesting and the most promising approach. Theoretically, GANs take an initially supervised learning tasks and convert them to unsupervised learning tasks by generating fake or synthetic looking data.

GANs helped to bring out many applications in the computer vision and graphics fields such as image blending [2], face aging [3], human pose synthesis [4], image manipulation applications [5], facial landmark detection [6] etc.

Despite the fact that these works produce effective and impressive image generators capable of synthesizing a diverse set of styles at high realism with explicit controls over attributes [7, 8, 10], modeling **complex distributions of datasets** such as real-scene images or art pieces remains difficult in unconditional configurations.

In Artinity, we are addressing this issue.



A simple design of the GAN architecture [1] (Source [9])



Source: StyleGAN3 [10]



Source: SofGAN [7]

## 👉 You?

### Technical skills & knowledge

- Experience in developing at least one significant (academic) project in the **computer vision, machine learning, and deep learning** fields
- Good **technical proficiency** in one or many programming languages (e.g. Python)
- Curiosity on various programming paradigms
- Basic knowledge of data structures and algorithms

### Background & mindset

- ✓ You have a scientific and engineering mindset

- ✓ You love communicating and expressing your ideas and thoughts
- ✓ You value work and self-improvement over diplomas and resumes
- ✓ You are self-driven while working in a team

### Last few words...

This is a unique opportunity whereby, as an intern, you will have the chance to learn several aspects about Computer Vision and the industrialization of a research project and to reinvent our industry.

 **Contact** 

[jobs@artinity.com](mailto:jobs@artinity.com)

### References:

- [1] Ian J. Goodfellow, Jean Pouget-Abadie, Mehdi Mirza, Bing Xu, David Warde-Farley, Sherjil Ozair, Aaron C. Courville, Yoshua Bengio. "Generative Adversarial Nets". NIPS 2014
- [2] H. Wu, S. Zheng, J. Zhang, and K. Huang, "GPGAN: Towards realistic high-resolution image blending," arXiv preprint arXiv: 1703.07195, 2017
- [3] Y. Liu, Q. Li, and Z Sun, "Attribute-aware Face Aging with Wavelet-based Generative Adversarial Networks," arXiv preprint arXiv: 1809.06647, 2019.
- [4] A. Siarohin, S. Lathuili, E. Sangineto, and N. Sebe, "Appearance and Pose Conditioned Human Image Generation using Deformable GAN," arXiv preprint arXiv: 1905.00007, 2019.
- [5] D. Bau, J-Y Zhu, H. Strobelt, B. Zhou, J. B. Tenenbaum, W. T. Freeman, A. Torralba, "GAN dissection: visualizing and understanding generative adversarial networks," arXiv preprint arXiv:1811.10597, 2018.
- [6] X. Yang, Y. Li, H. Qi, and S. Lyu, "Exposing GAN-synthesized Faces Using Landmark Locations," arXiv preprint arXiv: 1904.00167, 2019.

[7] Chen, Anpei and Liu, Ruiyang and Xie, Ling and Chen, Zhang and Su, Hao and Yu, Jingyi, "SofGAN: A Portrait Image Generator with Dynamic Styling", ACM transactions on graphics 2021.

[8] X. Wang, Y. Li, H. Zhang and Y. Shan, "Towards Real-World Blind Face Restoration with Generative Facial Prior," CVPR 2021

[9] Yabo Dan, Yong Zhao, Xiang Li, Shaobo Li, Ming Hu & Jianjun Hu, "Generative adversarial networks (GAN) based efficient sampling of chemical composition space for inverse design of inorganic materials", Nature, Article number: 84 (2020)

[10] Tero Karras and Miika Aittala and Samuli Laine and Erik Harkonen and Janne Hellsten and Jaakko Lehtinen and Timo Aila, "Alias-Free Generative Adversarial Networks (StyleGAN3)", NeurIPS 2021