

# ## AI-Generated Self-Portraits

**Time:** 2019

**Material:** programmed digital imaging

**Size:** 256px, 256px

**reference\_research\_paper:** "UGATIT:

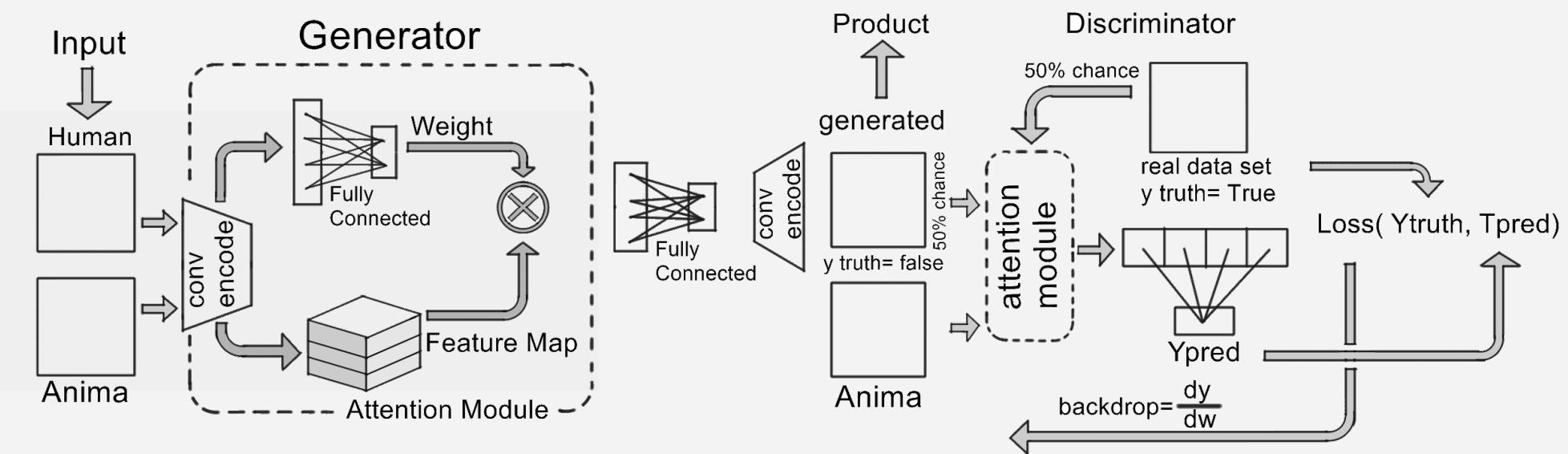
Unsupervised Generative Attentional Networks with Adaptive Layer-Instance Normalization for Image-to-Image Translation" (2019)

**dataset\_used:**

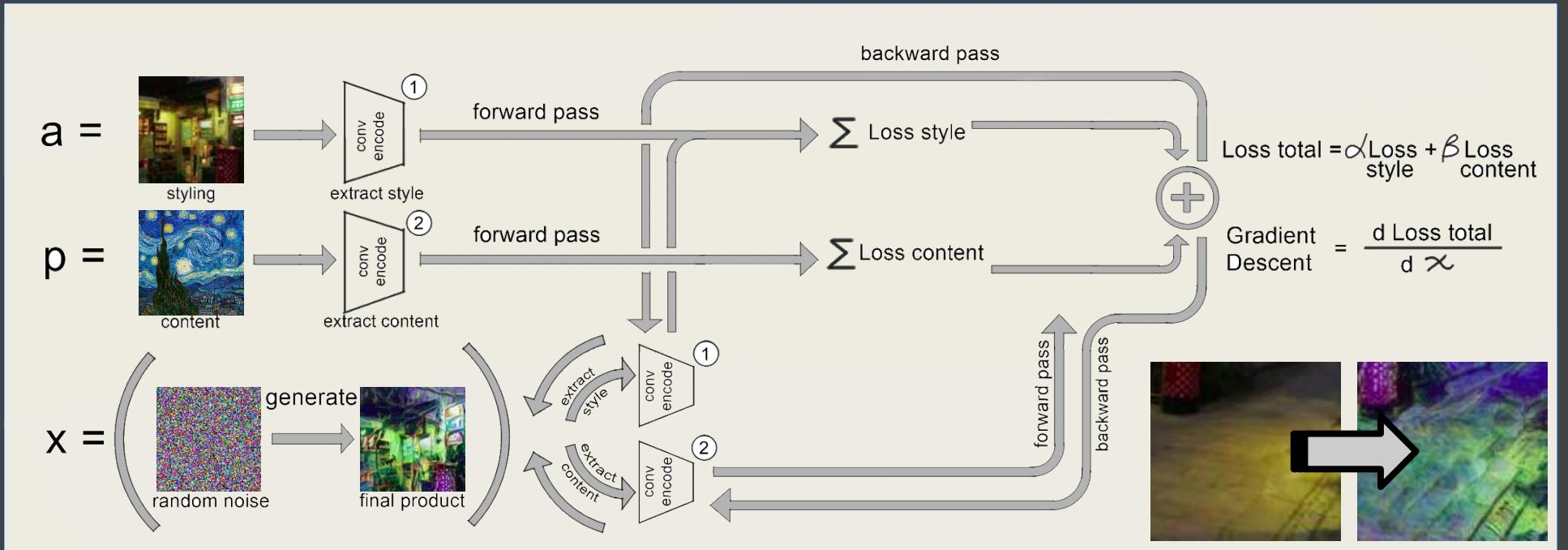
- animeface-character-dataset
- selfie-dataset

Different people have different perspectives on things. This artwork reflects literally how an Artificial Intelligence sees me.

I trained and deployed my Neural Network according to methods in an unpublished paper in Computer Vision. The resulting images are generated by code. (the training process is shown on the network architecture diagrams)



**network\_architecture:** Generative Adversarial Network (GAN)



network\_architecture: Convolutional Neural Networks

## ## AI as My Brush: Starry Town <sup>(1)</sup>

**Time:** 2018-2019

**Material:** programmed digital imaging

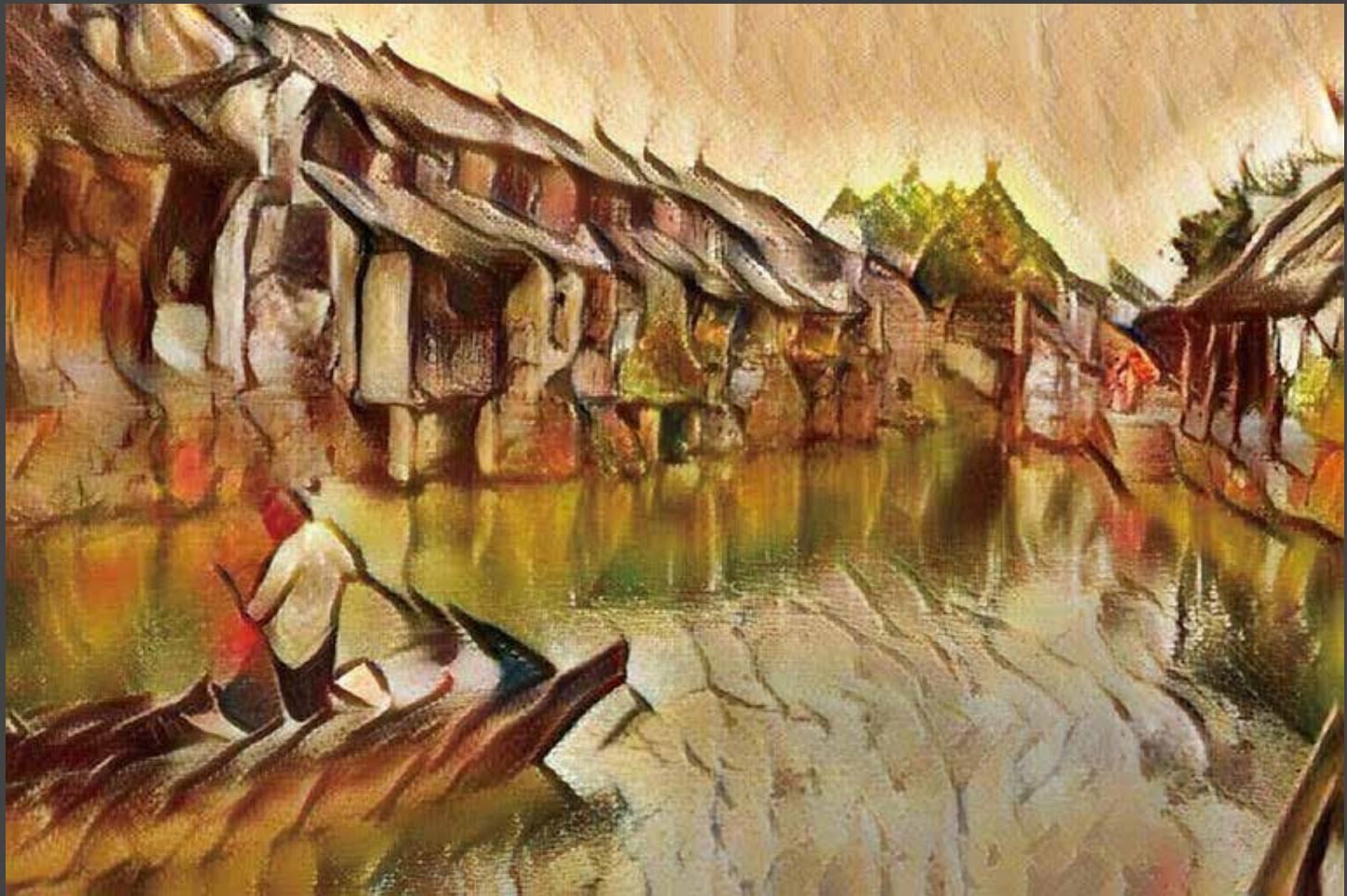
**Size:** 768px, 512px

**reference\_research\_paper:** Image Style Transfer Using Convolutional Neural Networks (CVPR 2016)

**allusion\_to:** Vincent van Gogh: "Cafe Terrace at Night"

Walking in an old town under the sunset,  
cafe shops lit up into the bustle,  
only with the starry sky still.





This is an old town: People who live outside want to get in, while people who live inside want to get out.

- A Nostalgic Feeling of My Hometown from Visiting Suzhou Watertown

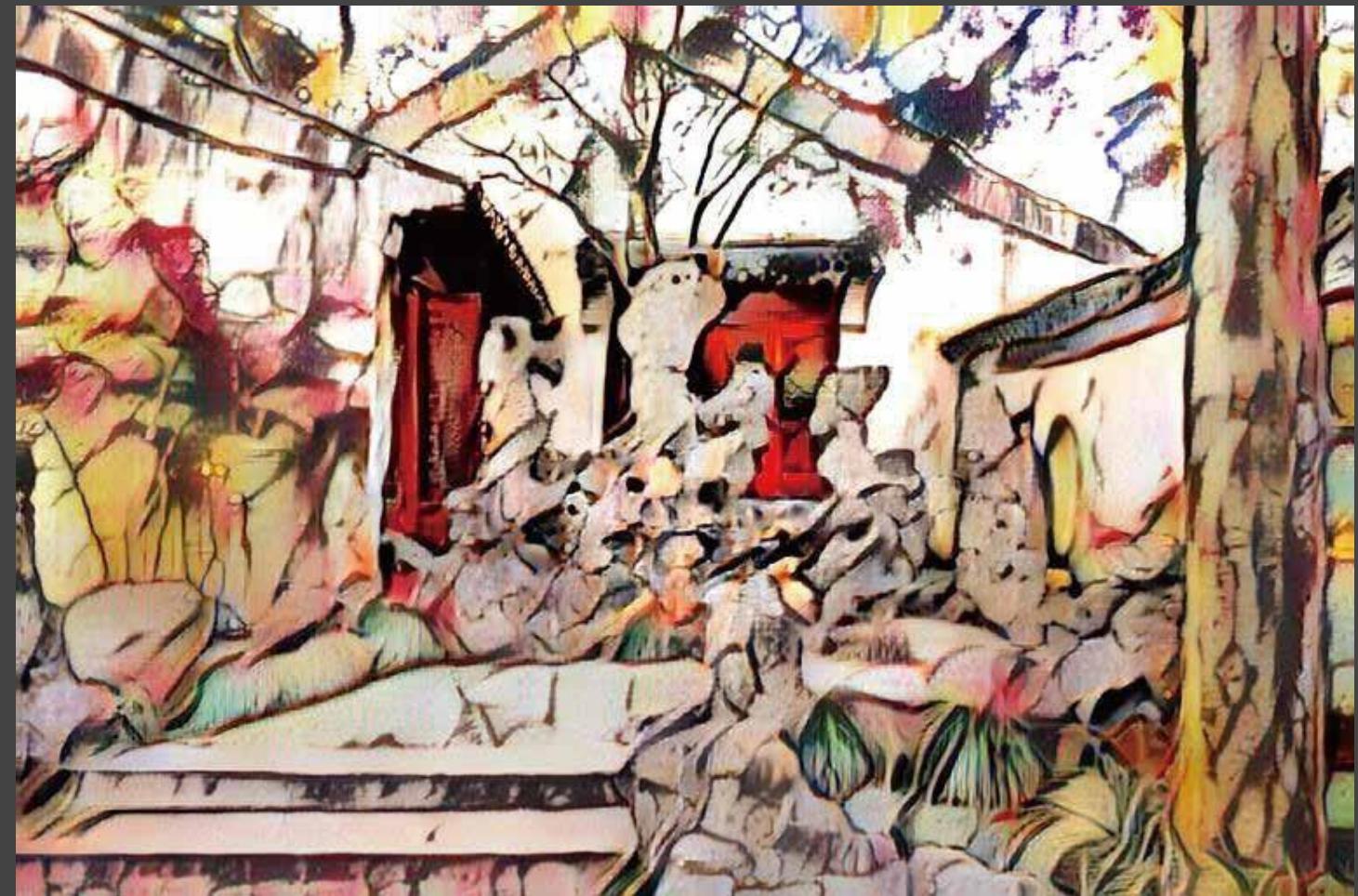


## ## AI as My Brush: Water Township <sup>(2)</sup>

**Time:** 2018-2019

**Material:** programmed digital imaging

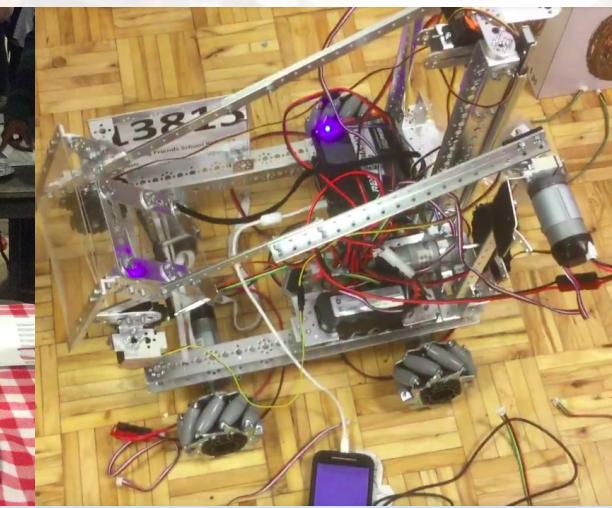
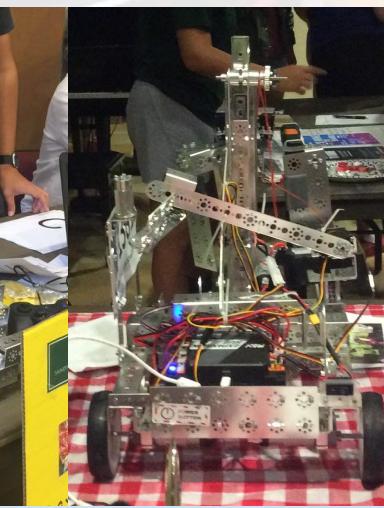
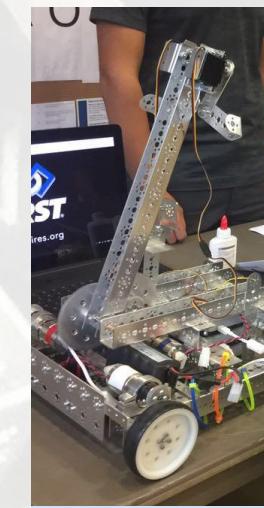
**Size:** 512px, 768px





**judges' award:**

From 2018 FTC  
Robotics  
Competition  
for team's  
"unique  
efforts,  
performance or  
dynamics merit  
recognition."

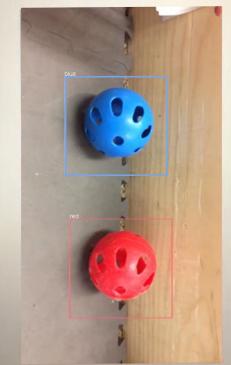


**Generation 1**

**Generation 2**

**Generation 3**

**Object Detection**



## ## BeestBot

**Time:** 2017-2019

**Material:** Steel, Motors, Servos, Rubber Bands, Sensors, acrylonitrile butadiene styrene (for 3D printing), etc...

**team\_project:** 2~20 teammates in 3 years.

**my\_position:** main hardware, software and electrical design

This autonomous robot is capable of picking and transporting "gold" and "silver" minerals; lifting itself onto a "rocket"; and landing to the "moon".

I designed the robot throughout 3 years. I deployed machine learning for object detection. I adjust motors' gear ratio for hooking and lifting itself from the ground.



TensorFlowTest

LOAD PICTURES



## ## BeestBot Logo & Team Uniform

**Time:** 2017-2019

**Material:** digital imaging, pre-shrunk cotton, poly/cotton blend (for t-shirt & hoodie)

**team\_project:** working with 2~20 teammates in 3 years.

In my 10th grade, I built our school's first STEAM community from ground-up. It is fascinating to see our team spirits from all grades unite together on one project.



# ## Silicon

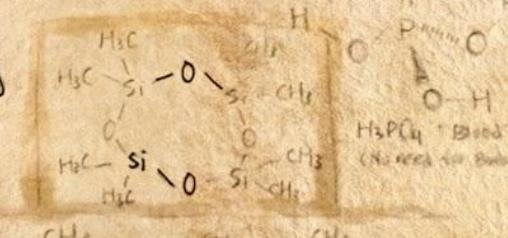
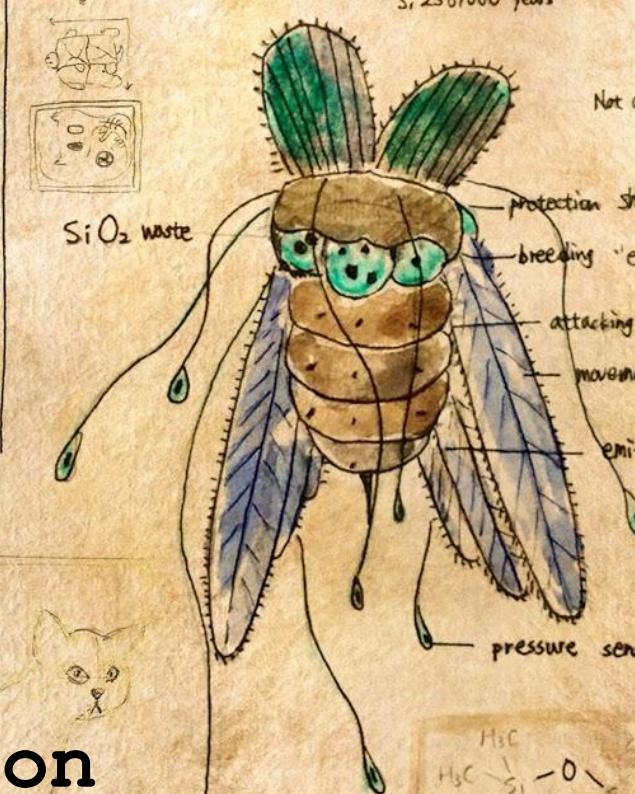
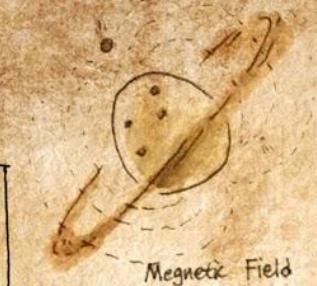
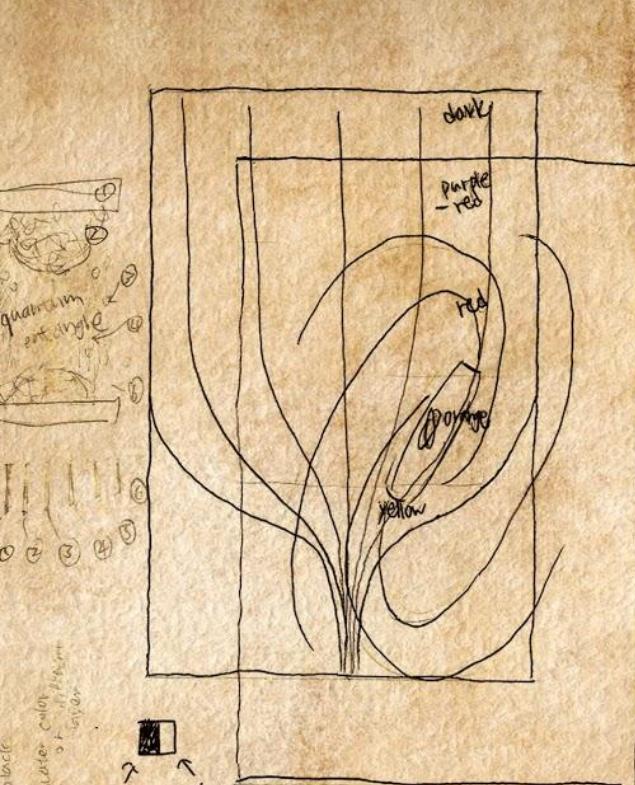
**Time:** 2018

**Material:** pen, watercolor

**Size:** 8 inches, 5 inches each page



**assignment:** 4 pages of 14 semester project - create whatever we want that has purpose



For example, key stone species can change their environment where they exist. There are various interactions between species.

- predation
  - symbiosis
    - commensal
    - parasitism
    - mutualism

Their method of  
pit dation can be  
various, too, incl.  
physical attack &  
chemical attack

There was  
a few tries like this,  
I have some good  
mechanics, but, you see -

Carbon Cyc

secondary / Consumers

Primary Producers are majority of chemotrophs.

primary consumers

Worms of plants being primary consumers

Heat radiation

Further breaking down by microbs

There was  
a few times like this  
the unsuccessful  
times like this  
the some times  
it's cool  
you see --

I have mechanics, but  
For example, key stoke species  
can change their environment

where they exist there  
are various interactions  
between species:

- predation
- symbiosis

- o commensalism
- o parasitism
- o mutualism

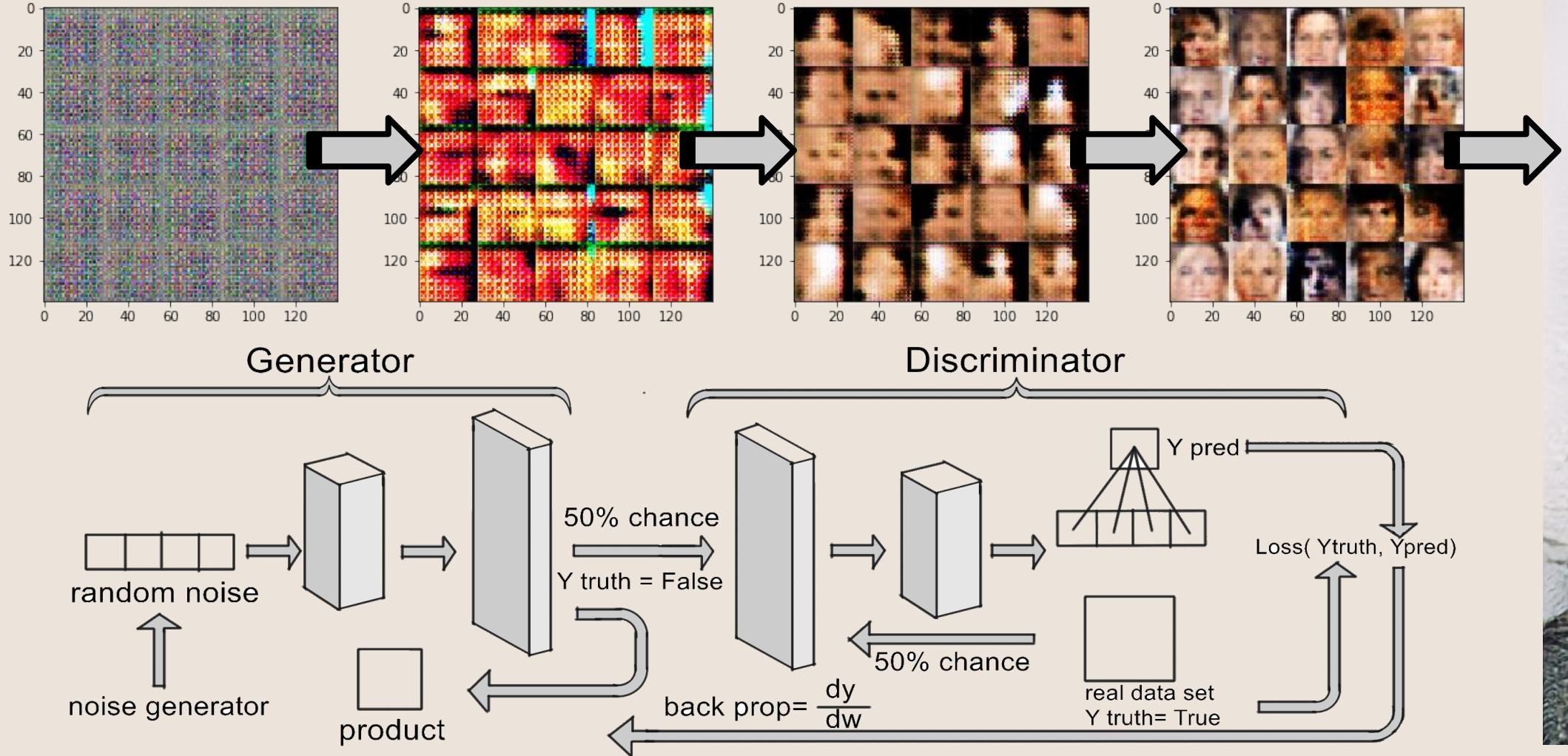
Their method of  
education can be  
various, too, including  
books, etc.

Physical attack and  
the hired attack.



∴ the layout is bad → ∴ progress of SP

Visualization of lives based on silicon instead of carbon.



## ## Fake News

**Time:** 2019

**Material:** programmed digital imaging

**Size:** 1024px, 1024px

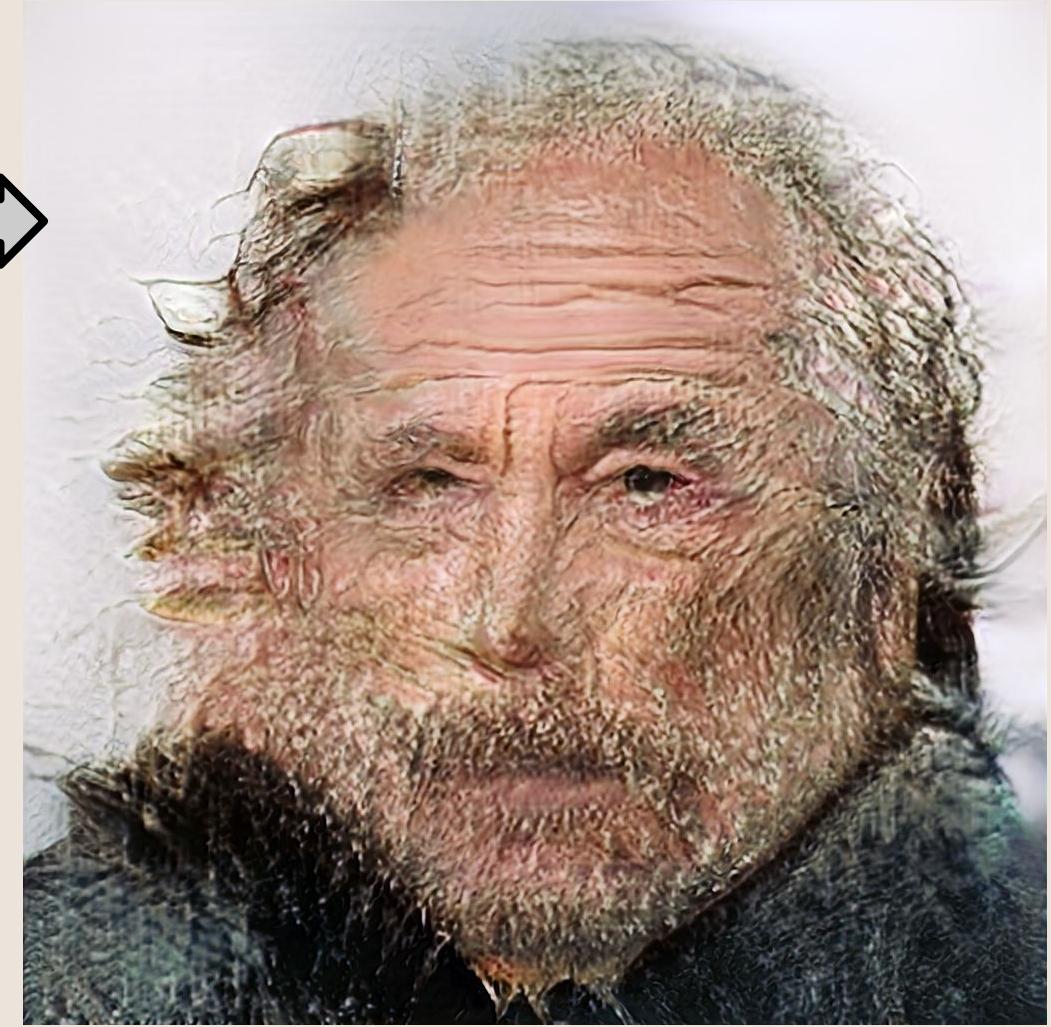
**reference\_research\_paper:**

"Generative Adversarial Networks"  
(2016)

**dataset\_used:** celebA

These paintings drawn by my AI algorithms was generated completely from random-noise inputs, which means that these people do not actually exist on earth.

I used this piece to demonstrates the power of AI and how the growing technology can create problems like "DeepFake crisis" in our society, to my classmates in Arts and Idea class.



# ## Line-only Drawings

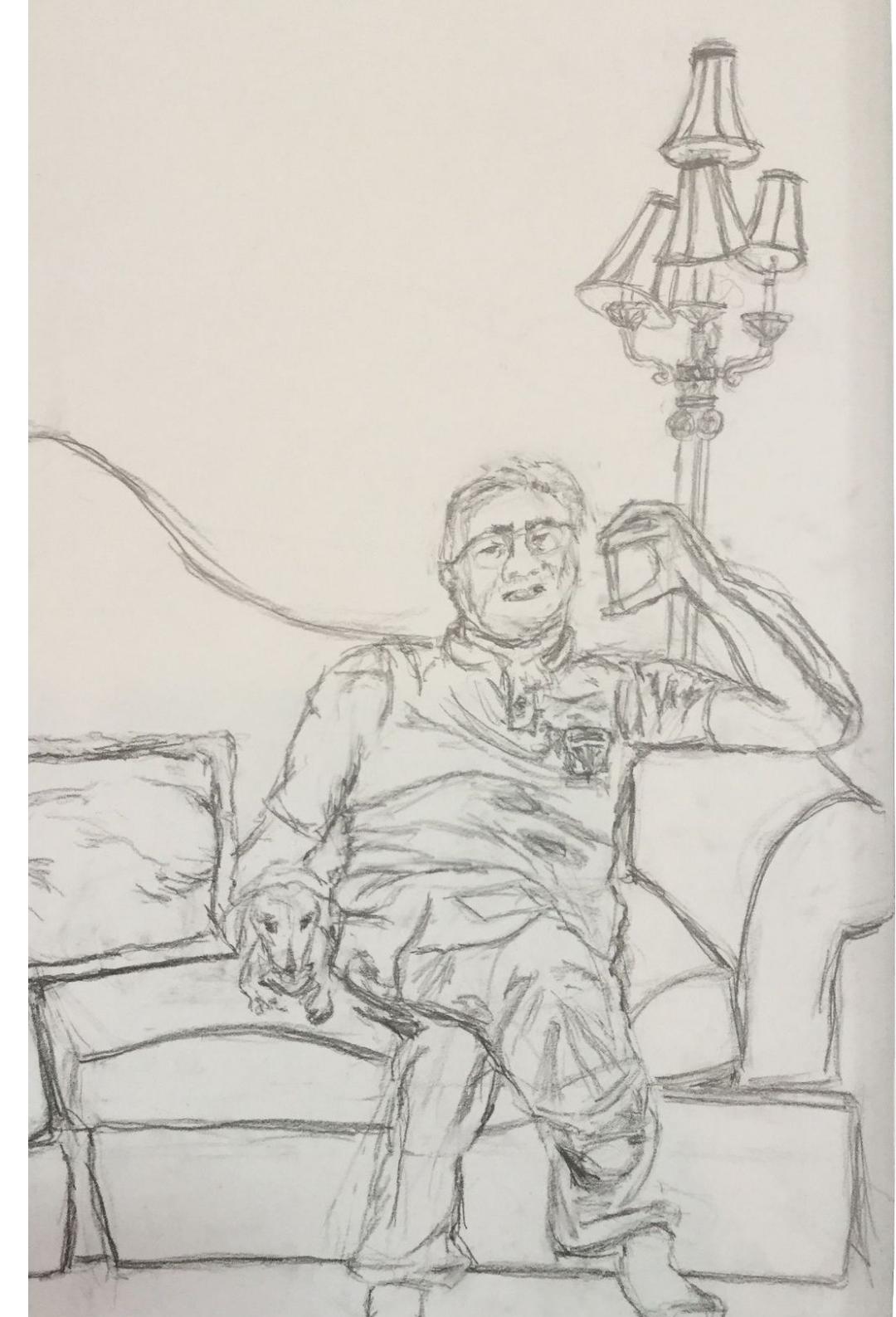
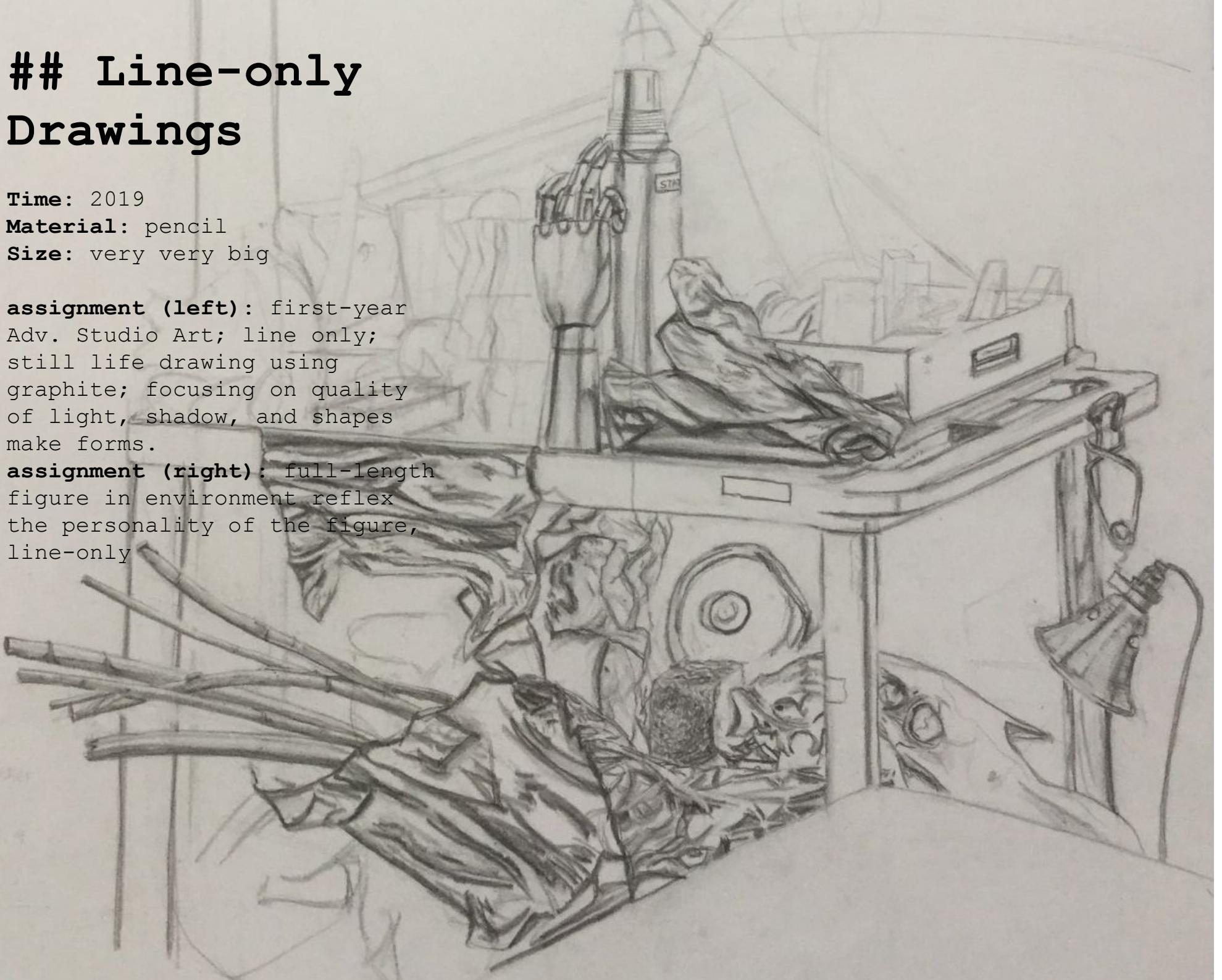
**Time:** 2019

**Material:** pencil

**Size:** very very big

**assignment (left):** first-year  
Adv. Studio Art; line only;  
still life drawing using  
graphite; focusing on quality  
of light, shadow, and shapes  
make forms.

**assignment (right):** full-length  
figure in environment reflex  
the personality of the figure,  
line-only



# ## Species of Flowers

**Time:** 2017

**Material:** 100% nature, (not from concentration)

**assignment:** Biology flower project - to identify, collect, label different species of flower

Collecting flowers in the spring was my past hobby to enjoy and study the nature. I identified and classified 80+ different species of flowers in Maryland. Now as I walk in the forest in the spring, my memories of the past flood out from my heart.





## ## Hunger Is Not a Game

**Time:** 2018

**Material:** digital animation

**Size:** 1 minute, 720px, 1280px

**tools used:** Adobe After Effects, Adobe Illustrator

**team project:** with 2 other people in Environmental Science class

**my position:** animation design, research, script design

I animated this Public Service Announcement about how the growing world population and unbalanced food distribution could potentially cause hunger in certain countries. Our team proposed two solutions: creating food bank and promote women's education.

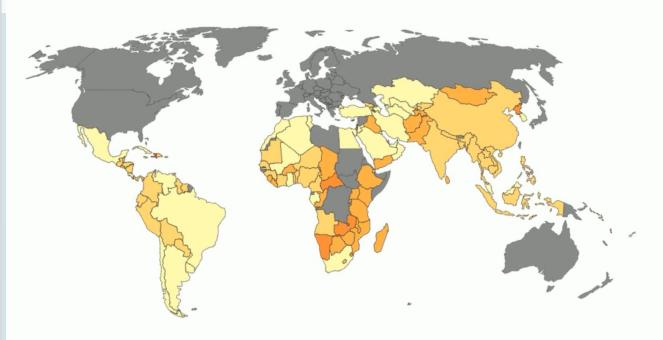
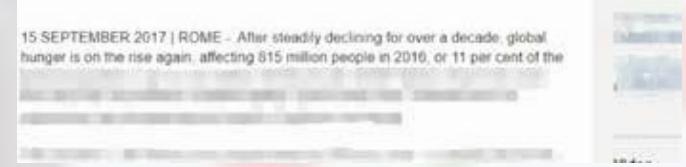


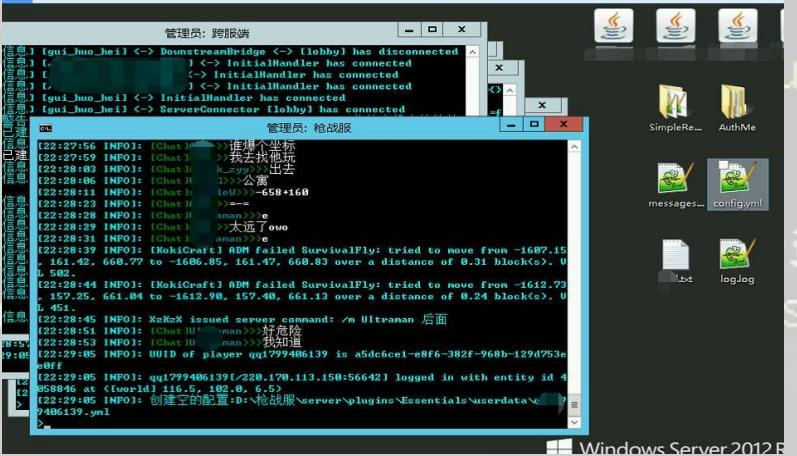
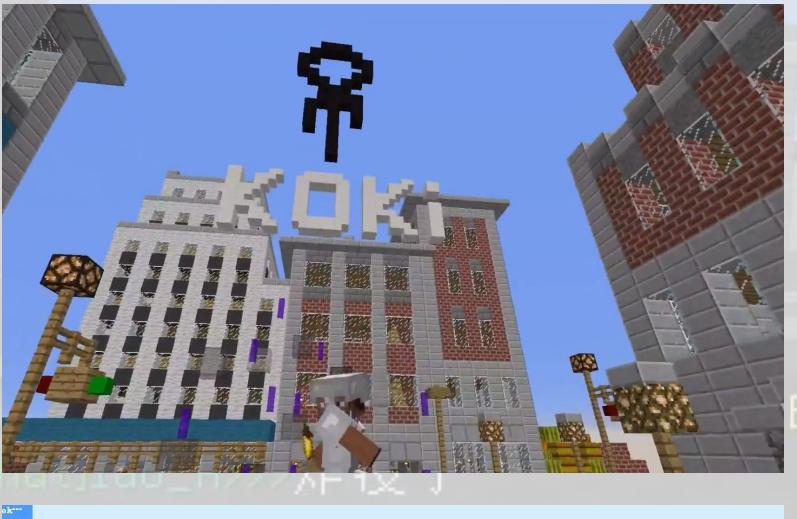
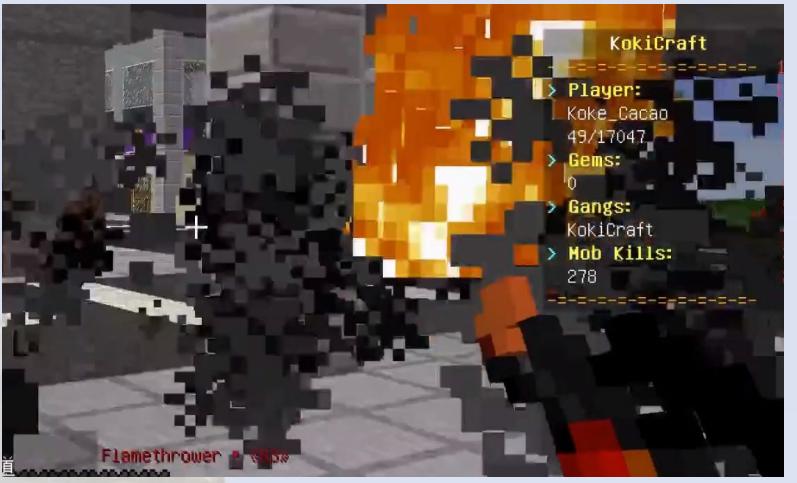
World hunger again on the rise, driven by conflict and climate change, new UN report says

815 million people now hungry – Millions of children at risk from malnutrition

News release

15 SEPTEMBER 2017 | ROME – After steadily declining for over a decade, global hunger is on the rise again, affecting 815 million people in 2016, or 11 per cent of the world's population.





## ## KokiCraft Game Server

(Game Design, Pixel Art, Interface Design)

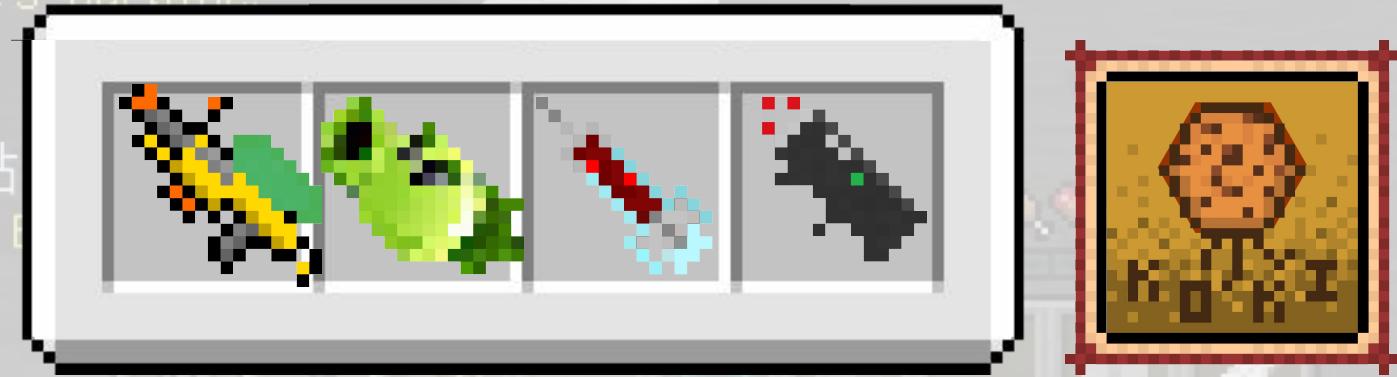
**Time:** 2014-2016

**Material:** programmed digital imaging, PhotoShop

**team\_project:**

At 14, I created "KokiCraft", a game serve that transformed Minecraft into a Grand Theft Auto-esque game with more player involvement and elaborate storyline through programming.

Here are some examples of my Icon, User Interface, and Game Mechanic Design as well as server's backend.



**Hanke Chen**

How romantic it is to learn things together with my AI model on weekends — [2019/02/02]

Rockville, MD

Technical Website

Twitter

GitHub

Instagram

About Me   Academic/AI Research   Robotics   Art   Miscellaneous

## ## Website Design

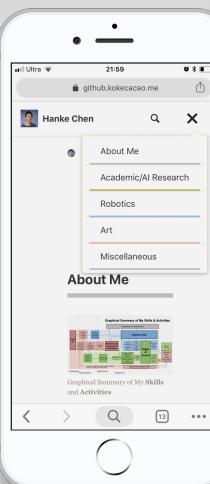
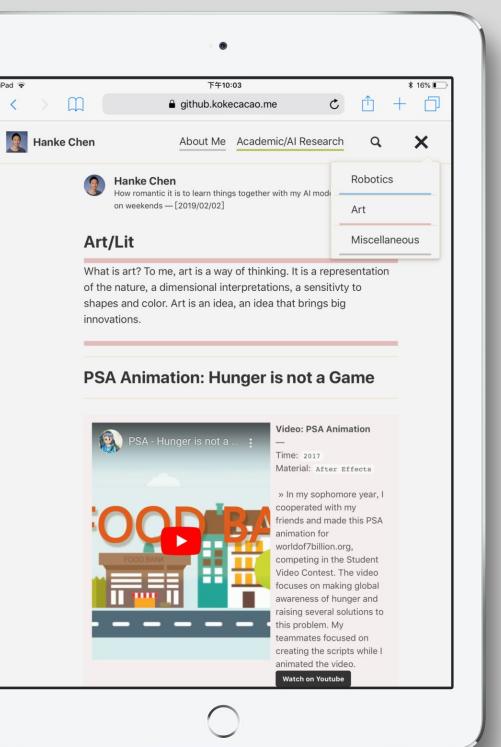
**Time:** 2018

**Material:** programmed digital imaging

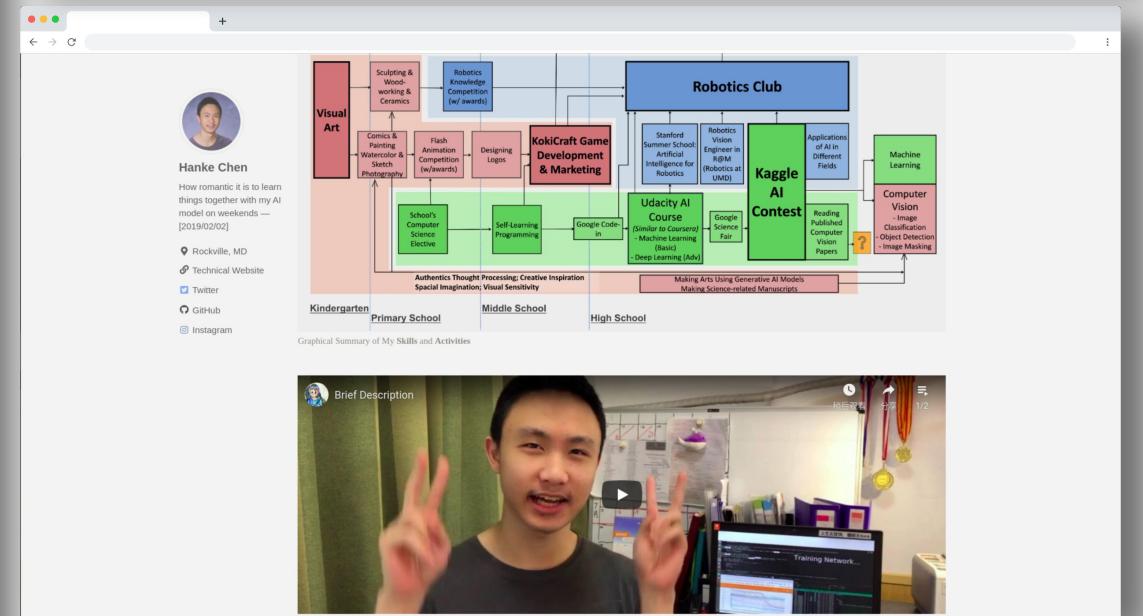
**tools-used:** ruby, html, css, jekyll

**link:** <https://chenhanke.me>

This general web page coded by myself showcases every aspect of me from AI Research, Robotics, to Art and Game Designs.



**Responsive UI Design:**  
automatic resize on phones



**Robotics**

Robotics is a conglomeration of Engineering, Computer Science, and Artificial Intelligence. AI is its brain whereas engineering creates its body.

**Artificial Intelligence for Robotics: Reinforcement Learning on Robotics**

Image: Reinforcement Algorithm and the Robot

Stanford Pre-Collegiate (Summer Institutes) Artificial Intelligence for Robots

Time: 2018

Achievements: Reinforcement Learning Algorithm

In this summer school, I followed Stanford CS231n curriculum and programmed a robot capable of doing tasks like dancing, sweeping the floor, and solving a maze. I also used Reinforcement Learning to optimize the path taken with dynamic risk calculations. This technology I programmed is important because it allows the robot to learn from its mistakes and improve over time.



# ## Conceptions of AP Environmental Science

Time : 2017

**Material:** watercolor on strathmore  
500

**assignment:** doodling from all 4 sides

This drawing contains all materials in an year-long course of AP Environmental Science. I used it as a review for my upcoming AP test.

# ## Brownie UI: A Personal Tech-Webpage

Time: 2017-now

Material: programmed digital imaging

link: <https://www.kokecacao.me>

This geek-style minimalistic design showcases my personal values toward lives to my friends. The use of line, shape, hue, and saturation gives the viewer a sense of intimacy.

## 0x05 Global Deployment — Sounds big, but it means social-network

[Github] [Bilibili] [Instagram]  
[Kaggle] [Twitter]  
[Zhihu] [WeChat]  
[Youtube] [Email]

### 👁| Computer Vision

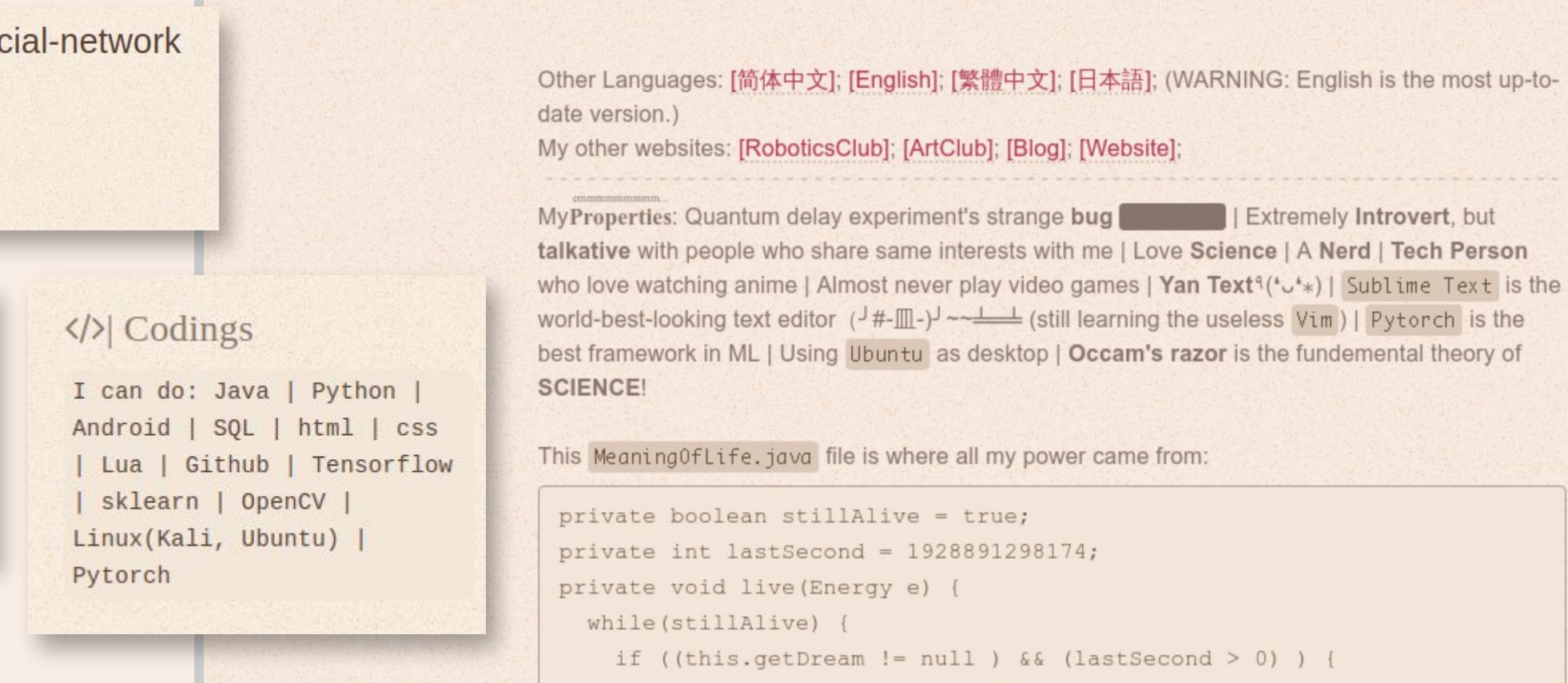
Currently taking Udacity's Deep Learning for 2nd year. Doing some Kaggle competitions. Studying CNN

...

(details shown)

⌚| Hamster  
Artificial Intelligence  
programmed on smartphone

💻| Codings  
I can do: Java | Python |  
Android | SQL | html | css  
| Lua | Github | Tensorflow  
| sklearn | OpenCV |  
Linux(Kali, Ubuntu) |  
Pytorch





## ## Class Logo Design

**Time:** 2016

**Material:** digital imaging

My design of the logo for my class includes the meaning of "growth", "love", and "peace". The class adopted my design onto our class t-shirt.





## ## The Night

**Time:** 2017

**Material:** relief print with water-based block print ink

**Size:** 18 inches by 12 inches

**assignment:** After looking at of variety of relief prints, to create your own relief print utilizing black on white shapes and white on black shapes within the same composition.  
(black on white and white on black)



## ## The Music of Natural Lines

**Time:** 2014-now

**Material:** photography in Suzhou, Guilin, Japan

**allusion\_to:** Ansel Adams photography of aspen trees