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# Yan Yang

Graduate Studies @ KAUST
Machine Learning R&D Engineer
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## Interests

- Machine Learning, Deep Learning
- Informatics, Information Theory
- Image Processing, Visualization
- CS Topics in Interdisciplinary Complex Systems (Cognitive Science, Social Science, Neuroscience, Biology, etc.)

## Skills

**Machine Learning:**

| | |
|---|---|
| Convolutional NN | ●●●●○ |
| NLP | ●●●○○ |
| Deep Reinforcement L. | ●●●○○ |
| Tensorflow | ●●●●○ |
| Keras | ●●●●● |
| PyTorch | ●●●●○ |
| Chainer | ●●●○○ |
| Numpy | ●●●●● |

**Data Processing and Visualization:**

| | |
|---|---|
| Dimension Reduction | ●●●●○ |
| Coloring | ●●○○○ |
| SQL | ●●●●● |
| Pandas | ●●●●● |
| Apache Arrow | ●●○○○ |
| Matlab | ●●○○○ |
| Excel | ●●●●● |
| Matplotlib | ●●●●○ |
| WebCanvas & Chart.js | ●●●●○ |

**General Programming:**

| | |
|---|---|
| C/C++ | ●●●●○ |
| Python | ●●●●● |
| Java | ●●●○○ |

**Web Development:**

| | |
|---|---|
| JavaScript | ●●●●● |
| Flask | ●●●●● |

## Formal Education / Degree

2023 – 2024 **Computer Science** — **KAUST**
**Courses**: Deep Learning for Visual Computing | Spatial Data Science with R | Modeling and Simulation of Biosystems **Supervisor**: Prof. Dominik Michels. **CGPA:** 3.550
Dynamical Systems | Computer Vision | Speech Recognition

2021 – 2022 **Ph.D. in Computer Science and Engineering** — **U. of Nevada, Reno**
**Courses**: Neurobiology | CS Topic: Bioinformatics | Independent Study: Computer Vision | Elements of Research Computing | CS Topic: Mass Detection in Mammograms | CS Topic: High-Performance Networking Systems **Supervisors**: Prof. Mircea Nicolescu and Prof. George Bebis. **CGPA:** 4.000
Computer Vision | Medical Imaging

2017 – 2019 **M.Sc. in Computer Science** — **Georgetown U.**
**Courses**: Algorithms | Computer Hardware & System Architecture | Comp. Corpus Linguistics | Empirical Methods in NLP | Stat. Machine Translation | Adv Semantic Representation | Automatic Reasoning | Machine Learning | Deep Reinforcement Learning | Independent Study: Advanced Analytics | Statistic Machine Learning (Ph.D. seminar, approved by instructor) **Supervisor**: Prof. Grace Hui Yang **CGPA:** 3.701
Machine Learning | NLP | Information Retrieval

2002 – 2006 **B.E. in Information Engineering** — **Southeast U., China**
**Courses**: Linear Algebra & Space Analytic Geometry **(scholarship endowed)** | Advanced Mathematics | Probability & Statistics | Numerical Computing & Modeling | Digital Image Processing | Speech Signal Processing | Signals & Linear System | Electromagnetic Field & Waves | Digital Systems & Course Design | Electronic Circuits & Comprehensive Experiment | Microcomputer Systems & Interfaces | Fundamentals of Circuit | Analog Electronic Circuits | Modern Psychology | Modern Biology | College Physics | Music Theory | Practice of MATLAB | etc. **CGPA:** 2.974

## Complementary Education / Certification

| | | |
|---|---|---|
| 2024 - now | Elements of Information Theory (Ongoing) | **Book by Thomas Cover** |
| 2024 - now | Introduction to Functional Analysis (Ongoing) | **MIT 18.102** |
| 2022 | Human Research (Social Behavior Research Investigators and Key Personnel Group, Basic) | **CITI Program - U. of Nevada, Reno** |
| 2020 | Certified Generalist Software Engineer (Top 3%) | **TripleByte** |
| 2017 | Gender Study Summer School (writing: A+; other: A) | **Harvard U.** |
| —- | **—Coursera—** | —- |
| 2023 | Probabilistic Graphical Models 2 (94/100) | **Stanford U.** |
| 2023 | Probabilistic Graphical Models 1 (100/100) | **Stanford U.** |
| 2022 | Computational Neuroscience (99.57/100) | **U. of Washington** |
| 2021 | Convolutional Neural Networks (100/100) | **Deeplearning.AI** |
| 2021 | Mathematical Biostatistics Boot Camp I (100/100) | **Johns Hopkins U.** |
| 2020 | Genomics: Decoding the Universal Language of Life (Unlicensed) | **UIUC** |
| 2020 | Finding Hidden Messages in DNA (Unlicensed) | **UC San Diego** |

## Publications

Dec, 2024 **Improving Searcher Struggle Detection via the Reversal Theory.** Discover Computing
Luo Jiyun, **Yan Yang**, Valerie Nayak, Grace Hui Yang

Apr, 2022 **Two-Step Data Augmentation for Masked Face Detection and Recognition: Turning Fake Masks to Real.** SCITEPRESS
**Yan Yang**, George Bebis, Mircea Nicolescu

Dec, 2021 **Feature Modulation to Improve Struggle Detection in Web Search: A Psychological Approach.** arXiv
Luo Jiyun, **Yan Yang**, Valerie Nayak, Grace Hui Yang

- RESTful
- React.js
- GoLang

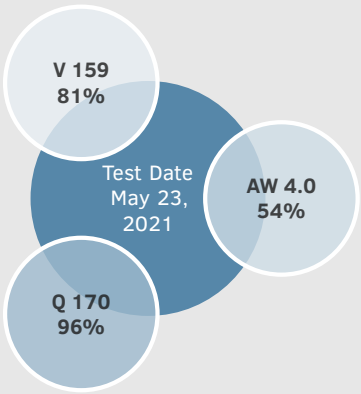
Project Management:

- Agile
- Docker
- LaTeX
- Git

Computing Resource Management:

- Nginx
- Google Cloud
- Slurm
- Kubernetes
- Linux

## Test Scores




## Profiles

## Languages

**Yue Chinese** (Mother Tongue)

**Mandarin** (Mother Tongue)

**English** (Proficient)

**Cantonese** (Elementary)

**French** (Elementary)

# Research and Teaching Work Experience

Sep, 2023 – Apr, 2024 — **Research Fellow** — **Computational Sciences Group (KAUST)**
- Researched to automate the **synthesis of diseased leaf images** used by **classification** models in agriculture. Explored methods to learn **diffusion-reaction systems** (i.e., PDE parameters) from data.
- Proposed ideas on Arabic **Speech Recognition**, including **acoustic source separation** and data augmentation in the **spectrogram**.

Jul, 2022 – Sep, 2022 — **Volunteer Research Assistant** — **Visual Perception Lab (U. of Nevada, Reno)**
- Trained for **BrainVoyager** usage and **human research ethics**.
- Helped with **software and package installations**.
- Read papers on **Representational Similarity Analysis**, **Multivoxel Pattern Analysis**, human brain's **face/object perception**, **fMRI**, etc., and discussed research ideas with other lab members based on their existing code and data.

May, 2021 – Aug, 2022 — **R&D Intern** — **Deepcell Inc.**
- Trained **GAN models**, supplementing data for cell image classifiers.
- Led the development of a comprehensive **CNN embedding layer visualization** tool, used company-wide by **data** and **bioinformatic scientists** for clustering, correlation analysis, etc., and greatly improved their productivity.

Jan, 2018 – May, 2019 — **Research Assistant** — **Georgetown U.**
- InfoSense Lab: 1) Translated **psychological reversal theory** into statistic languages to analyze search engine **user behaviors** (**search logs**) and improve **user struggle detection**; 2) Revamped search engine's **VR interface** for **behavioral data collection**, and provided **web technique** support for its SIGIR '18 conference demonstration;
- Massive Data Institute: "Victims of Violence" tweets analytics: **occupational analysis** and **database management.**

Jan, 2021 – Dec, 2021 — **Teaching Assistant** — **U. of Nevada, Reno**
- CS 302 (Spring 2021), Data Structure in C++.
- MATH 127 (Spring 2022), Precalculus II (**recitation classes**).

Jun, 2016 – Aug, 2016 — **Web Development Mentor** — **DataMesh (Chinese tech company)**
**Mentored new employees** on webpage building.

Jun, 2006 – Oct, 2008 — **Volunteer Psychology Supporter (Community Service)** — **Ayaohelp.com**
- Provided moral **support** & helped with life event strategic analyses.
- Posted essays/poems on **personal development** journeys, which were listed by the website host to attract site visitors.

# Scholarship and Presentation

Sep 2023 — Doctoral fellowship. — KAUST

Jan 2003 — Course scholarship for **Linear Algebra & Space Analytic Geometry**. — Southeast U. (China)

Apr 2022 — **Conference IMPROVE 2022 Talk** — SCITEPRESS
Presentation for **Two-Step Data Augmentation for Masked Face Detection and Recognition: Turning Fake Masks to Real**.

# Course Projects (*blue* ⋆= research project)

NLP / Computational Linguistics
- Shift-Reduce **semantic parser** (natural language) using **deep reinforcement learning**; (link) ⋆
- A Neural-Network **linguistic morphology cutter (Keras)**; (link) ⋆
- Course assignments: **N-gram**, **Perceptron**, Machine translation (e.g. **Estimation-Maximization**, **machine-aided translation**, etc.)

Computer Vision
- Analyzed **data augmentation** methods for **mammogram** mass **segmentation**. Quantitatively applied **adversarial training**; ⋆
- Used **image-to-image translation** GAN models to generate training images for **masked face detection** task; ⋆
- **Deep Reinforcement Learning** video game agents;
- **C++ Image processing** (Gaussian blur, flip, sharpening, etc.)

Analytics /
- Construction of I/O log datasets (Blue Water HPC); Future

| | |
|---|---|
| Data Crawling | throughput prediction (exact bytes): **AutoRegressive Integrated Moving Average**, **LSTM multi-layer RNN**s, & **Decision Tree Regressor**s; Performance analysis per dataset/model. ⋆<br>• "#MeToo in Tweets" analytics (topic modeling); (link) ⋆<br>• **Crawlers**: free books by Springer during COVID-19. (link) |
| Machine Learning | • Java **standard libraries** only: Build **ML learners** & reproduce paper results; **Automatic reasoning** projects. |
| Computer Systems | • C++: Multi-thread experiments \| Windows MineSweeper \| Linux embedded programs;<br>• Assembly hardware experiments: traffic light, etc.;<br>• VHDL: **8-bit CPU**; • Verilog: CPU Branching, MEM, ROM. |
| Non-CS | • Proposal on **brain vision connections** (BIOL675 Neurobiology) ⋆<br>• 5-minute **French** (**linguistic features** introduction)<br>• **MATLAB Graphs** for Middle school Algebras |

# Engineering Work Experience

| | | |
|---|---|---|
| Oct, 2022 – May, 2023 | **Machine Learning R&D Engineer** | **Deepcell Inc.** |
| | • Led the **system design** of the remodeled **Neural Network embedding** visualization system, which is to be used seamlessly in the Cluster-Based Sorting product. When the imaging phase of an imaging+sorting run is done, we use this design to pause the run and start a **data exploration session** to select sorting criteria.<br>• My system design covered decisions on **data storage media**, **database schemas**, **API specs**, **serialization/deserialization** options, **caching**, **parallelizing** large calculations, and others for incremental developing plans and long-term goals. | |
| May, 2021 – Aug, 2022 | **R&D Intern** | **Deepcell Inc.** |
| | • For the **CNN embedding layer** visualization tool, independently coordinated **user demand collection**, full-stack development, and **usability verification**.<br>• The second version refactored the app to **improve security** and separated large-chunk data processing into a **socket streaming service** for multiprocessing. | |
| Jun, 2020 – Jan, 2021 | **Member of Technical Staff** | **Pure Storage** |
| | • Implemented feature: import/restore **volume snapshots** from company disks into Kubernetes.<br>• Enhancement/bug fixing: **multipath device** problem, upgrading **bash scripts** to Python3, etc.<br>• Led the **Github release process** of Pure Service Orchestrator v6.0.3. | |
| Jun, 2016 – Aug, 2016 | **Development Engineer** | **DataMesh** |
| | • Led the development of a news publishing system implemented as a **React-Redux** app;<br>• Solved Apache deployment conflicts among static files, React router hack, and Python service. | |
| Jan, 2016 – Jun, 2016 | **Software Engineer** | **Meican.com** |
| | • Designed and implemented a **message push system** using **WebSocket**, **AngularJS**, and **GoLang Micro Service** for the meal website, which solved user complaints that pages don't sync the latest meal status;<br>• Code cleanness and reusability: encapsulated **WebSocket** in an **AngularJS Factory**. | |
| Jul, 2015 – Jan, 2016 | **Full Stack Engineer** | **Colorful Clouds Tech Ltd.** |
| | • Independently took charge of a weather report app with **dynamic charts** for precipitation and other weather metrics (AngularJS, Flask, NodeJS, AliCloud, Nginx, MySQL).<br>• Implemented a compatibility patch for **data API** v2, providing continued support to v1 clients.<br>• Automatic periodic **collection of API health data** into the Redis database.<br>• **Precipitation interpolation** using **NumPy**. | |
| Oct, 2014 – Jun, 2015 | **Frontend Developer** | **2 different companies** |
| | • Developed **WeChat minigames** for marketing activities. (https://github.com/DIMPLY/MiniGame-Zillionaire)<br>• Built webpages for an information management app, using D3.js for **data reports and charts**. | |
| Sep, 2013 – Oct, 2014 | **Web Development Engineer** | **2 different companies** |
| | Developed **C++-based** Windows apps (ID card verifier, Word Solitaire game) with Linux server. | |

# Other Work Experience

| | | |
|---|---|---|
| Dec, 2008 – Dec, 2012 | **English-Chinese Translator** | **Self-Employment** |
| | • Published dozens of translation articles on yeeyan.org<br>• Took charge of the translationorganization of *Women in The 19th Century* (Margaret Fuller 1843).<br>• Translated & proofread marketing materials, users' & developers' manuals, TV show subtitles, texts in software & games. Customers included Grand Strong and OK Translation. | |
| Apr, 2008 – Jan, 2009 | **Scientific Secretary** | **Tongji University** |
| | Supported department research and student activities as an administrative secretary. | |