Chun-Fu Yeh

Phone: +886-911-176-645 | Email: kevincfyeh@gmail.com | Web: https://yehcf.github.io/cfyehprofile/

PROFESSIONAL PROFILE

- Manage 3 research projects as an AI engineer lead to develop deep learning / machine learning applications for ophthalmology and pulmonology.
  - 2 conference paper and 2 patents
- Lead 2 projects as principal investigator, targeting the development of intelligent medical assistant solutions for ophthalmology and pulmonology.
  - Raised $1M (USD) in funding with these research proposals within 2 years
- Selected to be one of 30 alumni coaches as part of the inaugural IDEO U Alumni Fellowship program to engage and guide IDEO U online learners

WORK & RESEARCH EXPERIENCE

Artificial Intelligence Engineer & Principal Investigator 04/2017 - Present

Service Systems Technology Center (SSTC), Industrial Technology Research Institute (ITRI), Hsinchu, Taiwan

Project: **AI-based Early-stage Glaucoma Detection with Fundus Images**

- 01/2018 – 12/2019
- Developed an encoder-decoder CNN to predict the retinal nerve fiber layer defects based on fundus images. With GAN, the dice coefficient and correlation coefficient of the model increased (2%) compared to the baseline model (only encoder-decoder CNN)

Project: **The Development of Medical Devices for COPD Exacerbation Development Monitoring**

- 04/2017 – 12/2018
- Designed an innovative service system to help patients with chronic obstructive pulmonary disease (COPD) detect acute exacerbation earlier with abnormal lung sound detection
- Achieved 85.78% of accuracy for the model for lung sound detection, 5% higher than the accuracy reported in reference paper

Artificial Intelligence Engineer 09/2015 - Present

SSTC, ITRI, Hsinchu, Taiwan

Project: **Eye Alpha Zero – The Development of Incremental Learning for AI in Ophthalmology**

- 01/2019 – 12/2020
- Aim to develop an incremental learning algorithm for AI in Ophthalmology

Project: **Artificial Intelligence-based Diabetics Fundus Image Decision Support**

- 01/2017 – 12/2019
- Designed an AI-based system to prevent severe diabetic retinopathy among patients with diabetes
- Built model for classifying the severity of diabetic retinopathy with kappa score up to 84.15%, higher than that reported by Google and that of the 3rd place of Diabetic Retinopathy Detection Challenge in Kaggle

Research Assistant 09/2013 - 08/2015

Movement Science and Assistive Technology Lab,

School of Occupational Therapy, College of Medicine, NTU, Taipei, Taiwan

Project: **Development and Application of Rehabilitation Games for Children with Cerebral Palsy Using Motion Sensing Technology**

- Designed a Kinect-based rehabilitation program using modern therapeutic approach
- Collaborated with cross-disciplinary team, including occupational therapist, industrial designer, and software engineer

Chun-Fu Yeh
No. 195, Sec 4, Zhongxing Road Zhudong Township, Hsinchu County 310, Taiwan R.O.C
Phone: +886-911-176-645 | Email: kevincfyeh@gmail.com | Web: https://yehcf.github.io/cfyehprofile/

PATENTS

Yeh, C., Luo, Y., Chang, C., & Yeh, I. (2018) Method and system for automatically identifying and marking adventitious sounds. U.S. Patent, Patent Pending

Chang, C., Luo, Y., Lee, H., & **Yeh, C.** (2018) Lung sound monitoring device and lung sound monitoring method thereof. U.S. Patent 16/120,985, Patent Pending

Yeh, C., Tzo, S., & Tsai, M. (2016) Body motion analysis system, portable device and body motion analysis method. U.S. Patent 2018/0178060A1, Patent Pending

RESEARCH PUBLICATIONS

Journal Papers

Chen, H., **Yeh, C.**, & Howe, T. (2015). Postural control during standing reach in children with Down syndrome. Research in Developmental Disabilities, 38, 345-351. doi:10.1016/j.ridd.2014.12.024

Conference Papers & Posters

Yeh, C., Huang, M. & Wu, K. (2019) Localization of Retinal Nerve Fiber Layer Defect in Fundus Image by Visual Field Guided Learning Network. MICCAI (Submitted)

Yeh, C., Chen, G., Wu, K., & Huang, M. (2018) Feasibility of early detection for retinal nerve fiber layer defect with digital fundus image in glaucoma patients. The 31st IPPR Conference on Computer Vision, Graphics and Image Processing, Tainan, Taiwan, August 19-21. Oral Presentation

Chen, H., Lin, S., **Yeh, C.**, Wang, T., Tang, H., & Ruan, S. (2016). Development of a unilateral Kinect-based rehabilitation game for children with cerebral palsy. The 16th annual research colloquium of the Department of Occupational Therapy, National Taiwan University, Taipei, Taiwan.

EDUCATION

National Taiwan University (NTU), Taipei, Taiwan

Master of Science in Occupational Therapy 07/2013 - 08/2015

- *Master's Thesis:* The Effects of External Task Difficulties on Arm-Trunk Movements in Children with Hemiplegic Cerebral Palsy

Bachelor of Science in Occupational Therapy 09/2009 - 06/2013

- Dean's List - Ranked in top 5% of students in class for two semesters

PROFESSIONAL ACTIVITIES & TRAINING

Computer Vision Nanodegree Program (Course), Udacity 01/2019 – 04/2019

- Learned to build computer vision applications based with Pytorch, completing following projects:
  - Image Captioning with CNN plus RNN
  - Landmark Detection & Tracking using SLAM

Immersive Silicon Valley Training (ISVT), San Francisco, California 07/2018 - 09/2018

- Designated by the director of Service Systems Technology Center, ITRI
- Looked for potential business and research partners during 2.5-month business trip in Silicon Valley and promoted AI products developed at ITRI

Artificial Intelligence Nanodegree & Specializations (Course), Udacity 05/2017 - 02/2018

- Learned to build deep learning applications with Python, Tensorflow, and Keras, completing 4 projects:
  - Sign Language Recognizer with Hidden Markov Model
  - Facial Keypoints Detection with Convolution Neural Network
  - Machine Translation (French vs. English) with Recurrent Neural Network
  - End-to-end Speech Recognizer with Recurrent Neural Network

Chun-Fu Yeh
No. 195, Sec 4, Zhongxing Road Zhudong Township, Hsinchu County 310, Taiwan R.O.C
Phone: +886-911-176-645 | Email: kevincfyeh@gmail.com | Web: https://yehcf.github.io/cfyehprofile/

Deep Learning Nanodegree Foundation (Course), Udacity 01/2017 - 05/2017

- Learned fundamentals of deep learning, including convolution neural network, recurrent neural network, generative adversarial network and completed 3 projects:
  - Image Classification with Python and Tensorflow
  - TV Scripts Generation with Recurrent Neural Network
  - Human Face Generation with Generative Adversarial Network

IDEO U Design Thinking Courses, IDEO U 06/2016 - 10/2016

- Learned the mindset of design thinking and methods to drive innovation through the courses Insights for Innovation, Storytelling for Influence, From Ideas to Action, and Leading for Creativity

VOLUNTEER ACTIVITIES

IDEO U Alumni Coach, *IDEO U* 01/2017-07/2017

- Selected to be one of 30 alumni coaches as part of the inaugural IDEO U Alumni Fellowship program
- Provided guidance to learners, participated in workshops, and built a global community of practice
- Provided high quality, enriched contributions to the IDEO U community, demonstrated a robust understanding of the content (Design Thinking), and worked to apply learnings in my own contexts

SKILLS & CERTIFICATES

Languages: Mandarin (Native), English (Fluent; TOEFL iBT: 107/120 (R: 30, L: 27, S: 23, W: 27)
Technical: Python, Machine Learning (Scikit-learn), Deep Learning (Pytorch, Tensorflow), C++, HTML, CSS, Docker, Linux Shell
Certificate: Occupational Therapist

HONORS & AWARDS

Outstanding Youth Award, *NTU College of Medicine* 2014

- Selected by director of college as one of 7 outstanding youths due to clinical and research achievements

Altruism Award, *NTU College of Medicine* 2012

- Awarded by director of college for standing out from 30 classmates for leadership and contributions to class learning environment