

# Tse-Hou Hung

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## OBJECTIVE

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First year Ph.D. student at the National Tsing Hua University, Taiwan. Persistent, hard-working, and pursuing the sense of accomplishment. Looking for internship opportunities to gain knowledge and develop my research interests.

## RESEARCH INTERESTS

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**Augmented Reality, Virtual Reality, and Multimedia Networking, Immersive Streaming**

## EDUCATIONS

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### National Tsing Hua University (NTHU)

Ph.D. in Information Systems and Applications

Hsinchu, Taiwan

2020–Current

- Thesis Topic: 6-DoF Immersive Video Streaming to Head-Mounted Display
- Advisor: Cheng-Hsin Hsu (chsu@cs.nthu.edu.tw)

### National Tsing Hua University (NTHU)

M.S. in Information Systems and Applications, transferred into PhD program in summer 2020

Hsinchu, Taiwan

2019–2020

- GPA: 4.03/4.3.
- Advisor: Cheng-Hsin Hsu

### Chung Shan Medical University (CSMU)

B.M. in Health Policy and Management

Taichung, Taiwan

2015–2019

## TECHNICAL SKILLS

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- **Programming Languages** C/C++, Python,  $\text{\LaTeX}$ , Shell Script Programming, and Matlab
- **Tools/Frameworks** Unity, CUDA, Socket Programming, DASH, and MySQL

## PUBLICATIONS

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1. C. Fan, **T. Hung** and C. Hsu, Modeling the User Experience of Watching 360° Videos with Head-Mounted Displays, *Submitted to ACM Transactions on Multimedia Computing, Communications, and Applications (TOMM)*.
2. **T. Hung**, C. Hsu and C. Hsu, Optimizing Immersive Video Streaming Using Deep Learning Approaches: A Case Study on TMIV, *In preparation for a submission to ACM Transactions on Multimedia Computing, Communications, and Applications (TOMM)*.

## HONORS AND AWARDS

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- President Scholarship, NTHU 2020 –2023

## WORKING EXPERIENCE

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### Networking and Multimedia System Lab, NTHU

Research Assistant

Hsinchu, Taiwan

September 2019 - Present

- Our research spans over the network and rich media. We leverage various techniques to improve the quality of streaming applications, e.g., 360° video streaming, VR cloud gaming, and 6DoF VR video streaming.
- Participated Projects: 6-DoF Immersive Video Streaming, and Machine Learning Platform

### Computer and Communication Center, NTHU

Assistant System Administrator

Hsinchu, Taiwan

March 2020 - Present

- We build and maintain the university-wide learning management website, which used by more than ten thousand students and faculty members.

## RESEARCH EXPERIENCE

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### 6-DoF Immersive Video Streaming *(Supported by the MOST Project: Teleporting Through Space Across Time Using Head-Mounted Displays: A Case Study for Real Estate)*

Virtual Reality (VR) has become increasingly more popular in various business sectors. The modern VR systems that support six-degree-of-freedom (6-DoF) can provide more immersive experience, in which Head-Mounted-Display (HMD) user's viewport can be changed according to his/her position and orientation. However, because of the tremendous content size, 6-DoF immersive video streaming dictates too much bandwidth and computing resources. In this work, we propose a configuration optimizer that uses Reinforcement Learning (RL) and Convolutional Neural Network (CNN) to select the best configuration setting. Through real experiments, we show that our solution reduces the bandwidth and computing resource consumption while delivering good video quality.

### Machine Learning Platform *(Supported by the UMC Project: Development for AI Related Edge and Infrastructure)*

Machine Learning (ML) has been around for decades and is now commonly used in many fields. In recent years, more and more companies try to use ML techniques to achieve or improve their productibility. However, capitalizing the potential of ML needs a lot of domain knowledge, along with tons of tuning for the best performance. Furthermore, ML applications are not done after a model is trained. This is because the trained models may become outdated in the future, due to the drifts of concepts. Therefore, after deploying an ML model, we still need to monitor its performance and retrain it whenever necessary. To allow the ML developers to focus on analysis, we need an ML platform that can automate the routine tasks. In this project, we build such an ML platform, which consists of various tools to speed up data preparation, model building, service serving, and performance monitoring of multiple ML applications. We survey the existing platforms and generalize their components and functions. This leads to a general ML platform design that can be adopted in diverse scenarios. To demonstrate the practicality and efficiency of our design, we build a real testbed based on several open-source projects like Kubeflow. We use the testbed to conduct a case study, which results in a few new research problems, that were not solved in the literature. We are currently solving these problems jointly with the UMC colleagues.

## REFERENCE

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- Prof. Cheng-Hsin Hsu  
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National Tsing Hua University  
Hsinchu, Taiwan  
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- Dr. Chih-Fan Hsu  
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