SUHONG (SU) **KIM**

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TECHNICAL SKILLS

Programming	**Python/PyTorch, C/C++**, MATLAB/SIMULINK, Linux
Computer Vision	**Image/Video Processing and Manipulation**, Camera Model, 3D Geometry Modeling
+Deep Learning	**Object Detection**, Semantic Segmentation, **Image Generation**
Machine Learning	Statistical/Probabilistic Methods, **Data Engineering, Natural Language Processing**

PROFESSIONAL EXPERIENCE

RESEARCH ASSOCIATE | SIMON FRASER UNIVERSITY, BC — MAY 2019 - PRESENT

- Proposed and designed a novel unsupervised method to separate some unpleasant reflection from the taken image through a glass, which does not use any dataset but optimize the deep neuronal network on each sample image and shows better performance than other supervised works

  Python/PyTorch | Deep Image Manipulation | Unsupervised and Instance Learning

- Implemented the video reflection separation algorithm with a computational optimization approach, which produced the best quality of the results compared to the state-of-the-art works

  MATLAB | C++ | Video Processing | Computational Photography

RESEARCH ENGINEER | HYUNDAI MOBIS RESEARCH CENTER, KOREA — JUN 2012 - MAY 2016

- Developed the software of Electric Parking Brake systems regarding control algorithm, failsafe logic, and firmware of the target micro-controllers, as well as leading an international research team of six based in Tech Center in India both remote and on-site for the software verification and validation process, which was successfully launched

  Embedded C | Firmware | S/W Design and Testing | Vehicle Testing

- Spearheaded the design project of PBC (Parking Brake Control) aiming the re-architecture of legacy software and integration with the main brake system based on Model-Based Design with SIMULINK, which resulted in major automotive companies adopting the product worldwide

  MATLAB/SIMULINK | Model Based Design(MBC) | AUTOSAR | S/W Architecture Design

PUBLICATIONS

Perceptual Deep Image Prior for Single Image Reflection Separation — MAY 2020

currently working on the paper submission to the ACM Multimedia Conference in 2020 as a first author

Crime Analysis Through Machine Learning — NOV 2018

2018 IEEE 9th Annual Information Technology, Electronics and Mobile Communication Conference in Vancouver, BC

- Published the paper regarding Vancouver Crime Analysis to reinforce a patrol system
- Gave a presentation at the conference as a **first author**

https ://ieeexplore.ieee.org/document/8614828

EDUCATION

MSC IN COMPUTER SCIENCE | Siomn Fraser University, BC, Canada — SEP 2018 - FEB 2020

- Professional Master's Program in Visual Computing Specialization
- Courses : Machine Learning, Computational Photography and Image Manipulation, Geometry Modeling in Computer Graphics, Visual Computing Lab1,2, Frontiers of Visual Computing, Natural Language Processing

BSC IN MECHATRONICS | Handong Global University, Korea — MAR 2008 - AUG 2012

- Mechanical and Control System Engineering (Major) and Global Entrepreneurship (Minor)
- Received the national science and technology scholarship (2008-2009)

ACADEMIC PROJECTS

Computer Vision + NLP

An Enhanced Sketch2Scene Using Natural Language — SPRING 2020

Designed a new system to translate a simple sketch into various realistic scenes, and evaluated how NLP can improve the Sketch2Scene task with respect to quality and variety

Pytorch | Word embedding | Caption Generator | Text2Scene Generator

Children Stories Generator from Hand Drawings — FALL 2018

Proposed the creative application which allows us to extract unique stories from children's hand drawings, and designed the mixture model with both Image Captioning (CNN+RNN) and Story Telling (RNNs)

Python | OpenCV | Caffe | CNN+RNN

Computer Vision + Deep Learning

Semantic Image Segmentation — SPRING 2019

Implemented a pixel-wise image segmentation with Active Contour and extended it to semantic segmentation using U-Net, which gave me in-depth mathematical understanding and practical skills on low-level image processing as well as deep learning model.

PyTorch | Matlab | U-Net

Vehicle Object Detection — FALL 2018

With the Single Shot Multi-Box Detector (SSD), designed the full network architecture from the scratch and trained it on the cityscapes datasets to detect vehicles and pedestrians

PyTorch | Python | SSD

Safe Robot Tele-operation — FALL 2018

Implemented a keyboard based tele-operation system for the Turtlebot3 robot to check safety while moving on the ground using Simultaneously Localization and Mapping (SLAM) algorithm with Lidar data

C++ | ROS | SLAM | Lidar

Computational Photography

Generative Image In-painting — SPRING 2019

Implemented the Deep Convolutional Generative Adversarial Network (DCGAN) to recover damages in input images, and then analyzed the model to improve the performance with various experiments with other methods such as UNet, ResNet, and Poisson Blending algorithm

PyTorch | OpenCV | Matlab | DCGAN

Computer Graphics

Novel 3D Chair Generation — SPRING 2019

Applied the 2D projection and mix-n-match methods from the different views of images, and then developed the 3D deep neural network which returns a plausibility scores for generated 3D voxel chairs

c++ | Blender | OpenCV | 3D Rendering

EXTRA-CURRICULAR INVOLVEMENT

Teaching Assistant at SFU — SPRING 2019

Supervised the students enrolled in the Introduction to Computer Systems (CMPT295) as a lab tutor with the skills such as X86-64 assembly coding and digital system underpinnings

Scuba Dive Master in Thailand — SUMMER 2016

Participated in PADI Dive Master program for two months to train myself as a professional in scuba diving with multicultural fellow trainees, which made me more self-conscious and confident

President of the Mechatronics Academy — 2010-2011

Initiated the summer boot camp program for sharing how to implement C language in the embedded system at university, which resulted in a 95 % complete rate among 33 trainees