

# Yang, John

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U.S. citizen

## EDUCATION

### UNIVERSITY OF MICHIGAN, ANN ARBOR | B.S. IN PHYSICS

Concentrated in Interdisciplinary Physics | College of Literature, Science and the Arts  
Ann Arbor, MI, USA

### SEOUL NATIONAL UNIVERSITY | M.S. IN INTELLIGENT SYSTEMS

Concentrated in Intelligent Systems | Graduate School of Convergence Science and Technology  
Seoul, South Korea

### SEOUL NATIONAL UNIVERSITY | PH.D IN INTELLIGENT SYSTEMS (COMPLETED)

Concentrated in Intelligent Systems, Graduate School of Convergence Science and Technology  
Seoul, South Korea

## RESEARCH EXPERIENCE

### @ MACHINE INTELLIGENCE AND PATTERN ANALYSIS LABORATORY | RESEARCHER

Jan 2014 – Present | Seoul, Korea

### RESEARCH INTERESTS

Deep Learning, Reinforcement Learning, Interpretability of Deep Learning, (Hand) Pose Estimation

### RESEARCH ACHIEVEMENTS

Learning Disentangled Representations of Independently Controllable and Uncontrollable Factors using Action-Conditional  $\beta$ -VAE - Submitted to ACML 2019

- Proposed a semi-supervised method of disentangling independently controllable and uncontrollable factors in the latent space with which an agent in a reinforcement learning setting is able to explicitly learn self-concept in a given environment.
- Tackles the blackbox issue by encouraging an RL policy network to learn interpretable latent features through an implementation of AC- $\beta$ -VAE to share the backbone structure.
- Enables ex post facto governance into desired behaviors of a precedently optimized RL agent by controlling interpretable latent factors.
- A draft version is provided in [this link](#).

Image Translation to Mixed Domain using Sym-parametrized Generative Network - Submitted to ICCV 2019

- Introduced a concept of Sym-parameter and its learning method that mix various loss functions and synchronize them with input conditions.
- Proposed Sym-parametrized Generative Network that mixes the characteristics of various data and loss functions and translates images to any mixed-domain without ground truths, such as 30% Van Gogh and 20% Monet.
- A link to the supplementary video material is provided in [this link](#).

Genetic-gated Neural Network for Deep Reinforcement Learning - NIPS 2018

- Proposed Genetic-gated Neural Network which is a neural network that combines a gate vector composed of binary genetic genes in the hidden layer(s) of networks.
- The proposed method takes both advantages of gradient-free optimization and gradient-based optimization methods, of which the former is effective for problems with multiple local minima, while the latter can quickly find local minima.
- The paper is provided in [this link](#).

Broadcasting Convolutional Network for Visual Relation Reasonings - ECCV 2018

- Proposed a BCN module that overcomes conventional loss of spatial information of convolutional neural networks without much increase in computational complexity.
- Proposed multiRN that extends the concept of 'pairwise relations' in conventional Relation Networks to 'multiwise relations' by relating each object with multiple objects at once.
- The paper is provided in [this link](#)

## Kernel Parameter Selection by Gap-Maximization between Intra and Inter-Class Samples - BigComp 2016

- Tries to solve the problem of the vague criterion on selections of kernel function and kernel hyper-parameters for Kernel tricks typically used for SVM and PCA methods.
- Proposed an objective function for optimizing a combination of different kernels and kernel hyper-parameters.
- The paper is provided in [this link](#).

## Object Localization Using Image Classification Score - ICCV 2015 Workshop

- Developed an algorithm and participated in ImageNet Challenge (ILSVRC 2015).
- Proposed a classification method that learns bounding box information from the results of classifier rather than from CNN features, using the classification score before softmax layer as a feature.
- Details are provided in [this link](#)

## ACHIEVEMENTS

### **BK GRADUATE RESEARCH FELLOW | RESEARCH FELLOWSHIP**

Jan 2015 – Present | Seoul, South Korea

Awarded of a research fellowship from Brain Korea 21 Program for Leading Universities & Students

### **SUPER CHALLENGE HACKATHON 2016 | 2ND PLACE & BEST TECHNOLOGY AWARD**

Sep 2016 | Seoul, South Korea

Set up a prototype vision hardware with a small screen and an arduino chip attached to a glasses. Arduino is programmed to present texts to deafs through the screen on the glasses after interpreting a speech input of another person through speech recognitions. Our product is briefly shown in the video with [this link](#) at between 1:57 - 2:02.

### **SUPER CHALLENGE HACKATHON 2015 | BEST BUSINESS MODEL AWARD**

Sep 2015 | Seoul, South Korea

Set up a prototype vision-hardware with a webcam attached to a 3-D modeled glasses. The webcam's vision is calibrated with the sight through the glasses, and if a user with low vision physically points at an object, the object is visually enlarged and presented to the user. The product's presentation was supposed to be performed ideally with Google Glass, but simulated with a laptop. The corresponding hackathon is summarized in the video with [this link](#).

### **DARPA ROBOTICS CHALLENGE 2015 FINALS | 7TH PLACE**

June 2014 – June 2015 | Pomona, CA, USA

Participated as TeamSNU and ranked in 7th place. Implemented and trained algorithms to detect a staircase, a fire valve, door knobs and other objects to assist the robot accomplishing missions such as turning fire valves, ascending a staircase, walking through or clearing debris and etc.

## PROJECTS

### **KOREAN NATIONAL AGENCY FOR DEFENSE DEVELOPMENT | PROJECT MANAGER**

Jun 2016 – Nov 2017 | Daejeon, South Korea

Sponsored by Korean National Agency for Defense Development (ADD). Implemented online detection algorithms such as YOLO and SSD in ADD control tower platform of public CCTVs.

### **SAMSUNG ELECTRONICS | ASSISTANT RESEARCHER**

Jan 2014 – Apr 2015 | Suwon, South Korea

Developed an automated system to detect tolerance-bands of defected semiconductor PKG balls with stereo vision inputs, and provided the program to the Samsung factory located at Suwon, Korea.

## LANGUAGES

### **PROGRAMMING**

Prefer :

Pytorch • Tensorflow • Python • Matlab • Shell • HTML • PHP • Javascript

Familiar:

C++ • Android (XML) • MySQL

### **SPOKEN & WRITTEN**

Native fluency:

English, Korean

## OTHER EXPERIENCES

### **TEACHING**

- Samsung DS Department NPEX course Deep Learning Tutorial

## **INTERNSHIPS AT ARCHITECTURE OFFICES**

In my early college years, my concentration was Art & Design and I had interned in architecture firms with a desire to get experiences in practical art forms functioning for humans. My career has transitioned to machine learning during Master's program at SNU.

### **@ ATELIER LION SEOUL | INTERN**

May 2012 – Aug 2012, May 2013 – Dec 2013 | Seoul, South Korea

- Directly participated in two projects: Yoon Dong-Ju (Korean poet) Memorial Hall and Book cafe of the Samchung Park.
- Assisted senior designers in terms of adjusting floor plans and communicating with construction labors on sites.
- Designed front desks, display booths, introductory brochures, direction signs and more.

### **@ MAP GROUP | INTERN**

May 2010 – Aug 2010 | Seoul, South Korea

- Enrolled in the Internship Program, practicing architectural design softwares such as AutoCAD and Rhino
- Assisted senior designers in terms of drawing and adjusting floor plans through communications with the construction department.

## REFERENCE

### **NOJUN KWAK, PH.D**

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