

## Duin Baek

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### Education

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**Stony Brook University, New York, US**

January 2014 – Dec 2021 (expected)

- Ph.D. Candidate of Engineering in Computer Science, GPA: 3.85/4.0

**Yonsei University College of Engineering, Seoul, Korea**

March 2008 - February 2014

- Bachelor of Science in Electrical Engineering, GPA: 3.61/4.5

### Research Focus

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#### Machine learning application for

- 1) Improving Quality of Experience in Video Streaming Service
- 2) Video Compression Using Machine Learning
- 3) User Authentication by Analyzing Human-related data (Bio & Sensor data)

### Publications (family name changed from 'Back' to 'Baek', \*Equal Contribution)

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1. **Duin Baek**, Hangil Kang, and Jihoon Ryoo, "SALI360: Design and Implementation of Saliency based Compression for 360 Video Streaming", ACM MMSys'20, Istanbul Turkey, June 8<sup>th</sup>
2. **Duin Baek**, Jing Chen, and Bong Jun Choi, "Small Profits and Quick Returns: An Incentive Mechanism Design for Crowdsourcing under Continuous Platform Competition", IEEE Internet of Things Journal, Sep 13, 2019 (2018 JCR IF: 9.515)
3. **Duin Baek**, Pratik Musale, and Jihoon Ryoo, "Walk to Show Your Identity: Gait-based Seamless User Authentication Framework Using Deep Neural Network", ACM WearSys 2019, Seoul Korea, June 21
4. **Duin Baek**, hangil Kang, and Jihoon Ryoo, "Saliency based 360° Video Contents Encoding for Streaming Service" (poster), ACM MobiSys '19, June 17-21 2019
5. **Duin Baek\***, Pratik Musale\*, Simon Woo, and Bong Jun Choi, "You Walk, We Authenticate: Lightweight Seamless Authentication based on Gait in Wearable IoT Systems", IEEE Access, March 08, 2019 (2018 JCR IF: 4.098)
6. **Duin Baek\***, Pratik Musale\*, and Bong Jun Choi, "Lightweight Gait-based Authentication Technique for IoT System," 2018 IEEE 4<sup>th</sup> World Forum on Internet of Things, Singapore, Feb 05-08 2018
7. **Duin Baek\***, Pratik Musale\*, Simon Woo, and Bong Jun Choi, "Lightweight Gait-based Authentication Technique for IoT System," ACM CoNEXT 2017, Student Workshop, Incheon Korea, Dec 12-15 2017
8. **Duin Back**, Bong Jun Choi and Jing Chen, "Small Profits and Quick Returns: A Practical Social Welfare Maximizing Incentive Mechanism for Deadline-Sensitive Tasks in Crowdsourcing," AAAI HCOMP 2017, Work-In-Progress paper, Quebec Canada, Oct 23-26 2017
9. **Duin Back** and Bong Jun Choi, "SWIM: Social Welfare Maximizing Incentive Mechanism for Smart Meter Data Aggregation," IARIA Green 2016, Nice France, July 24-28, 2016
10. Tan N. Le, **Duin Back**, and Bong Jun Choi, "The Evaluation of Wireless Communication in Microgrids using OPNET," International Smart Grid Conference, Gwangju, Korea, Oct 12-14 2015

## Ongoing Research

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1. Computation-Efficient Super-Resolution for Video Streaming Service
2. Heterogeneous Gait (walking and running) based User Authentication

## Projects Experience

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Low-cost professional-cleaning multiple-robot system (for complex, multi-floor, and wide environments)

- Global ATC (Advanced Technology Center), Ministry of Trade, Industry and Energy, South Korea, April 2017 – December 2017
- Role: Fleet Management Platform Design & Robot Coverage Path Optimization

SALI360: Saliency-based 360 Video Streaming Service

- National Research Foundation, January 2017 – Present
- Role: Saliency-based VR Video Encoding

## Hackathon Experience

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GaitKeeper: an authentication service that achieves secure and interactionless authentication by learning a user's unique *gait* and combining it with user device history. [[Hack@CEWIT 2020](#), Netsmart's & Payfone's Pick]

## Computer Language Proficiency

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**Python:** Big Data analysis (numpy, pandas), Machine learning (scikit, sklearn, tensorflow, keras), Computer vision (opencv)

**Java (android programming), Javascript, C++, SQL**

## Patent & Certificate

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Encoding and Decoding Method for Virtual Reality Video	Patent Application (10-2018-0147686) in Korea
NLP with Deep Learning in Python	UC-9OFOJESB, Udemy August 2017
Natural Language Processing (NLP) in Python	UC-D1GT3IHQ, Udemy August 2017

## Scholarships

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Merit-based scholarship (1/3 <sup>rd</sup> tuition)	Fall 2011
National Scholarship for Science and Engineering (full tuition)	2012–2013
IT Consilience Creative Program (ITCCP) scholarship (full tuition + housing)	2014–2016

## Teaching Assistant

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CSE215 Foundations of Computer Science (Discrete Mathematics)	Spring 2017
CSE219 Computer Science 3 (Android Application Design and Development)	Spring 2017