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[Google Scholar](#)

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## INTRODUCTION

I am an integrated Ph.D. student advised by [Noseong Park](#) in the Dep. of *Artificial Intelligence* at Yonsei University. I have a broad interest in graph neural networks, recommender systems, spatio-temporal forecasting, and differential equations. Recently, I have been working on developing graph-based deep learning methods inspired by differential equations in natural science.

I was an undergrad at Jeonbuk National University (2016-2020), majoring in *software engineering*. I was privileged to be advised by [Suntae Kim](#) and [Duksan Ryu](#).

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## RESEARCH INTEREST

- Artificial Intelligence
  - Graph Neural Networks
  - Recommender Systems
  - Spatiotemporal Forecasting
  - Neural ODEs/CDEs/RDEs
- Software Engineering (SE)
  - Software Defect Prediction
  - SE for AI & AI for SE

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## RESEARCH EXPERIENCE

<b>Integrated Ph.D Student</b> <i>Big Data Analytics Lab (BigDyL)</i> , Yonsei University (Advisor: Prof. <a href="#">Noseong Park</a> )	<i>Aug 2020 - Now</i>
<b>Undergraduate Student Research Assistant</b> <i>AI &amp; SE Lab</i> , Jeonbuk National University (Advisor: Prof. <a href="#">Duksan Ryu</a> )	<i>Jan 2020 - Aug 2020</i>
<b>Undergraduate Student Research Assistant</b> <i>SSEL(Software System and Engineering Laboratory)</i> , Jeonbuk National University (Advisor: Prof. <a href="#">Suntae Kim</a> )	<i>Nov 2018 - Nov 2019</i>

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## EDUCATIONAL BACKGROUND

<b>Integrated Ph.D, Artificial Intelligence</b> <i>Yonsei University</i> , Seoul, Republic of Korea	<i>Sep 2020 - Now</i>
<b>Bachelor, Software Engineering</b> <i>Jeonbuk National University</i> , Jeonju, Jeollabuk Do, Republic of Korea	<i>Mar 2016 - Aug 2020</i>
<ul style="list-style-type: none"><li>• <i>magna cum laude</i> (GPA: 3.98/4.50)</li></ul>	

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## PUBLICATION

Hwangyong Choi, **Jeongwhan Choi**, Jeehyun Hwang, Kookjin Lee, Dongeun Lee and Noseong Park, "Climate Modeling with Neural Advection-Diffusion Equation," *Knowledge and Information Systems*, 2022. [[IF=3.205](#)]

Seoyoung Hong, Heejoo Shin, **Jeongwhan Choi**, and Noseong Park, "Prediction-based One-shot Dynamic Parking Pricing," In *Proceedings of the 31st ACM International Conference on Information and Knowledge Management (CIKM)*, 2022. [[pdf from arxiv.org](#)][[GitHub](#)]

**Jeongwhan Choi**, Hwangyong Choi, Jeehyun Hwang and Noseong Park, "Graph Neural Controlled Differential Equations for Traffic Forecasting," In *AAAI*, 2022. [[pdf from arxiv.org](#)][[pdf from AAAI](#)][[GitHub](#)][[Regular Paper Acceptance rate: 14.2% \(1,161/8,198\)](#)] [[Overall Acceptance rate: 15.2% \(1,370/9,020\)](#)]

Taeyong Kong, Taeri Kim, Jinsung Jeon, **Jeongwhan Choi**, Yeon-Chang Lee, Noseong Park and Sang-Wook Kim, "Linear, or Non-Linear, That is the Question!," In Proceedings of the 15th ACM International Web Search and Data Mining Conference (WSDM), 2022. [[pdf from arxiv.org](#)][[GitHub](#)] [[Regular Paper Acceptance rate: 15.8% \(80/505\)](#)] [[Overall Acceptance Rate: 18% \(315/1,765\)](#)]

**Jeongwhan Choi** and Duksan Ryu, "Self-Supervised Learning Using Feature Subsets of Software Defect Data", In *Proceedings of the Korea Software Congress (KSC)*, Dec. 2021, pp.203-205.

Jeehyun Hwang, **Jeongwhan Choi**, Hwangyong Choi, Kookjin Lee, Dongeun Lee and Noseong Park, "Climate Modeling with Neural Diffusion Equations", In *Proceedings of the 21st IEEE International Conference on Data Mining (ICDM)*, 2021. [[pdf from arxiv.org](#)][[GitHub](#)] [[Regular paper acceptance rate: 9.9% \(98/990\)](#)] [[Overall Acceptance Rate: 20% \(198/990\)](#)]

**Jeongwhan Choi** and Duksan Ryu, "Bayesian Optimization Framework for Improved Cross-Version Defect Prediction", *KIPS Transactions on Software and Data Engineering (KTSDE)*, Vol. 10, No. 9, pp. 339-348, Sep. 2021.

**Jeongwhan Choi**, Jinsung Jeon, and Noseong Park, "LT-OCF: Learnable-Time ODE-based Collaborative Filtering", In *Proceedings of the 30th ACM International Conference on Information and Knowledge Management (CIKM)*, 2021. [[pdf from arxiv.org](#)][[Github](#)] [[Regular paper acceptance rate: 21.7% \(271/1,251\)](#)] [[Overall Acceptance rate: 22% \(1,101/4,989\)](#)]

**Jeongwhan Choi** and Duksan Ryu, "Bayesian Optimization Framework for Cross-Version Defect Prediction", In *Proceedings of the 23rd Korea Conference on Software Engineering (KCSE 2021)*, 2021, pp. 63-72. [[Best Paper](#)]

**Jeongwhan Choi**, Jiwon Choi, Duksan Ryu and Suntae Kim, "Improved Prediction for Configuration Bug Report Using Text Mining and Dimensionality Reduction," *Journal of KIISE*, 2021, Vol. 48, No. 1, pp. 35-42.

**Jeongwhan Choi** and Duksan Ryu, "A Study on the Applicability of Transfer Learning Techniques for Cross-Project Defect Regression," In *Proceedings of the Korea Software Congress (KSC)*, 2020, pp. 150 - 152.

**Jeongwhan Choi**, Duksan Ryu, and Suntae Kim, "Comparative Study of Transfer Learning Models for Cross-Project Automotive Software Defect Prediction," In *Proceedings of the Korea Computer Congress (KCC)*, 2020, pp. 257-259.

**Jeongwhan Choi**, Jiwon Choi, Duksan Ryu, and Suntae Kim, "Prediction for Configuration Bug Report Using Text Mining," In *Proceedings of the 22nd Korea Conference on Software Engineering (KCSE 2020)*, 2020, pp. 350-357.

**Jeongwhan Choi**, Jiwoo Noh, and Suntae Kim, "Prediction Techniques for Difficulty Level of Hanja Using Multiple Linear Regression," *J. Inst. Internet, Broadcast. Commun.*, vol. 19, no. 6, 2019.

Seounghan Song, **Jeongwhan Choi**, Mingu Kang, and Cheoljung Yoo, "A Software Module That Analyzes the Relationship Between Headline and Content of the Web Article: CHIMERA," in *Proceedings of the 2019 KIIT DCS Summer Conference*, 2019, vol. 14, pp. 437-440.

**Jeongwhan Choi**, "Iceberg-Ship Classification in SAR Images Using Convolutional Neural Network with Transfer Learning," *J. Internet Comput. Serv.*, vol. 19, no. 4, pp. 35-44, 2018.

## AWARDS

Innovation Award, Yonsei University (Best paper in Dept. of Artificial Intelligence)

Jul 2021

- 대학원 혁신 우수 논문상 (학과우수상)

Best Paper Awards in KCSE 2021 in Software Engineering Day

Feb 2021

- Received the best paper award in the 23rd Korea Conference on Software Engineering (KCSE 2021)

Best Awards in Software Engineering Day

Dec 2019

- Software Engineering Day, Dep. of Software Engineering, Jeonbun National University
- A Software Module That Analyzes the Relationship Between Headline and Content of the Web Article: CHIMERA

Best Paper Awards, Korean Institute of Information Technology

Jun 2019

- A Software Module That Analyzes the Relationship Between Headline and Content of the Web Article: CHIMERA

The National Scholarship for Science and Engineering, KOSAF(Korea Student Aid Foundation)

2018-2019

- This scholarship supports undergraduates with strong academic performance in science and engineering, with the purpose of developing future leaders in those fields.

Academic Excellent Scholarship

2016-2019

- Jeonbun National University grants a scholarship for the student who has the best grade.

## TALKS

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Invited talk on Top-conference session, Korea Computer Congress (KCC 2022)

Jul 2022

- [slide link](#)

Graph-based Collaborative Filtering and Neural ODEs, 한국인공지능학회(KAIA) | LG AI Research

Nov 2021

- This talk is part of a tutorial called "Deep Learning Inspired by Differential Equation".
- [slide link](#)

## SERVICE

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- Reviewer in IEEE Transactions on Intelligent Transportation Systems in 2022
- External reviewer in ICDM 2021, 2022

## PATENT AND S/W PROGRAM

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[S/W] LT-OCF: Learnable-Time ODE-based Collaborative Filtering (학습 가능-시간 상미분방정식 기반 협업 필터링), 한국저작권위원회(등록번호: C-2021-052779), 2021.12.

Dec 2021

[Issued Patent] 학습시간 상미분 방정식 기반의 협업 필터링 추천 장치 및 방법, Noseong Park, **Jeongwhan Choi**, Jinsung Jeon, Domestic Patent(Issued Number: 10-2021-0177928). 2021.12.13

Dec 2021

[Granted Patent] Apparatus and Method for Measuring Difficulty Level of Chinese Character Using Regression Analysis(회귀 분석을 이용한 한자 난이도 측정 장치 및 방법), Suntae Kim, **Jeongwhan Choi**, Jiwoo Noh, Domestic Patent(Application Number:10-2019-0141339 ). 2019.11. [\[link\]](#)

Nov 2019

## CERTIFICATIONS

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University Machine Learning Camp in Jeju, Jeju University

Aug 2020

- [See credential](#)

IBM Blockchain Foundation for Developers , Coursera

Feb 2018 - Present

- License 5MMQUBFW2K3 ([See credential](#))

**Machine Learning Engineer Nanodegree**, Udacity

*Jan 2018 - Present*

- [See credential](#)

**Machine Learning**, Coursera

*July 2017 - Present*

- License EEYYGQPCFLN7 ([See credential](#))

## SKILLS

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### Tools & Technologies,

- PyTorch, TensorFlow, Python
- Java, C/C++, R, LaTeX, VBA, Unified Modeling Language
- Android, Matlab, Git, RSA
- MySQL, Tomcat, JSP, HTML, Javascript, JUnit

### Industry Knowledge,

- Artificial Intelligence, Graph Neural Networks, Neural Ordinary Differential Equations (Neural ODEs), Recommender Systems, Time-series Forecasting, Spatio-temporal Forecasting, Software Defect Prediction
- Software Engineering, Object Oriented Programming, Design Pattern, Compiler, Software Testing(Static Analysis)
- Text Mining, Image Processing for SAR Image
- ARM Cortex-M3, ESP-8266

## PROJECTS (FROM 2017 TO 2019)

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Prediction for Configuration Bug Report Using Text Mining

*Nov 2019 - Dec 2019*

- The purpose of this project is to predict the configuration bug reports using machine learning techniques and NLP.

Development of capability assessment evaluation algorithm for personalized self-study with Hanja-Chinese parallel(한자-중국어 병행 맞춤형 자기 학습을 위한 학습 역량 진단 평가 알고리즘 개발) *Dec 2018 - Expected Nov 2019*

- The purpose of this project is to solve the problems of existing Hanja character difficulty selection method.
- It includes the technique for measuring the difficulty of Hanja characters using artificial intelligence.
- It also covers personalized learning induction technique using a clustering model.
- A patent was derived from this project. "회귀 분석을 이용한 한자 난이도 측정 장치 및 방법 (APPARATUS AND METHOD FOR MEASURING DIFFICULTY LEVEL OF CHINESE CHARACTER USING REGRESSION ANALYSIS)"

Stock Price Prediction Model Based LSTM to Maximize Return on Investment

*Oct 2018 - Dec 2018*

- The purpose of this project is to predict the long-term stock flow based on the AI prediction model and to derive meaningful ROI.
- This project has a paper which is not submitted.
- [See project](#)

Advanced Lane Finding Project

*Jul 2018*

- The goal is to find the lane line using advanced techniques.
- [See project](#)

Vehicle Detection

*Jul 2018*

- The Software Pipeline to Detect Vehicles in a Video.
- [See project](#)

Clone Driving Behavior

*Jun 2018*

- The goal is to clone driving behavior via the CNN model.
- [See project](#)

Recipe Assistant App

*Apr 2018 - Jun 2018*

- This project is the recipe assistant app which helps people to cook an easy way.
- [See project](#)

Tic-Tac-Toe game for LPC 1768

*Jun 2018*

- This project is the Tic-Tac-Toe Game using ARM Cortex-M3(LPC 1768)
- [See project](#)

Lane Finding Project

*Mar 2018*

- The goal is to find the lane lines on the road.
- [See project](#)

Iceberg Classifier

*Jan 2018*

- The goal is to create an image classification model that finds icebergs among SAR images collected by satellites.
- This project has a paper published in JICS.
- [See project](#)

Helicopter Battle Game

*Apr 2017 - Jul 2017*

- This project is the game improvement project in Java.
- [See project](#)

Smart Mailbox

*Sep 2017 - Dec 2017*

- This project is the smart mailbox notifies a user when a new mail arrives at the mailbox.
- [See project](#)