

JEONGWHAN CHOI
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[Google Scholar Link](#)

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](#).

RESEARCH INTEREST

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

RESEARCH EXPERIENCE

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

EDUCATIONAL BACKGROUND

Integrated Ph.D, Artificial Intelligence <i>Yonsei University</i> , Seoul, Republic of Korea	<i>Sep 2020 - Now</i>
Bachelor, Software Engineering <i>Jeonbuk National University</i> , Jeonju, Jeollabuk Do, Republic of Korea	<i>Mar 2016 - Aug 2020</i>
• <i>magna cum laude</i> (GPA: 3.98/4.50)	

PUBLICATION

Jaehoon Lee, Chan Kim, Gyumin Lee, Haksoo Lim, **Jeongwhan Choi**, Kookjin Lee, Dongeun Lee, Sanghyun Hong and Noseong Park, "Time Series Forecasting with Hypernetworks Generating Parameters in Advance," *arXiv preprint arXiv: Arxiv-2211.12034*, 2022. [[pdf from arxiv.org](#)]

Jeongwhan Choi, Seoyoung Hong, Noseong Park and Sung-Bae Cho, "Perturbation-Recovery Method for Recommendation," *arXiv preprint arXiv: Arxiv-2211.09324*, 2022. [[pdf from arxiv.org](#)]

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 & SCHOLARSHIPS

- Innovation Award, Yonsei University (Best paper in Dept. of Artificial Intelligence) *Jul 2021*
- [Media link](#)
- 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

- Talk on 1st Workshop on AI held by Yonsei Univ. [[slide link](#)][[Poster](#)] *Oct 2022*
- Poster presentation for AIGS Symposium 2022 held at the COEX Grand Ballroom [[Poster](#)] *Aug 2022*
- Invited talk on Top-conference session, Korea Computer Congress (KCC 2022) [[Slides](#)] *Jul 2022*
- Tutorial on Korea Artificial Intelligence Association (KAIA) *Nov 2021*
- Topic: "Graph-based Collaborative Filtering and Neural ODEs"
 - This talk is part of a tutorial called "Deep Learning Inspired by Differential Equation" [[Slides](#)].

SERVICE

- Reviewer in Learning on Graph Conference (LoG) 2022
- Reviewer in IEEE Transactions on Intelligent Transportation Systems in 2022
- External reviewer in ICDM 2021, 2022

PATENT AND S/W PROGRAM

- [Issued Patent] Graph Neural Controlled Differential Equations for Traffic Forecasting, Noseong Park, **Jeongwhan Choi**, Jeehyun Hwang, Hwangyong Choi, Domestic Patent(Issued Number: 10-2022-0151819). 2022.11.14 *Nov 2022*
- [S/W] LT-OCF: Learnable-Time ODE-based Collaborative Filtering, Korea Copyright Commission, C-2021-052779, 2021.12. *Dec 2021*
- [Issued Patent] LT-OCF: Learnable-Time ODE-based Collaborative Filtering, 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, Suntae Kim, **Jeongwhan Choi**, Jiwoo Noh, Domestic Patent(Application Number:10-2019-0141339). 2019.11. [\[link\]](#) *Nov 2019*

CERTIFICATIONS

University Machine Learning Camp in Jeju , <i>Jeju University</i>	<i>Aug 2020</i>
<ul style="list-style-type: none">• See credential	
IBM Blockchain Foundation for Developers , <i>Coursera</i>	<i>Feb 2018 - Present</i>
<ul style="list-style-type: none">• License 5MMQUBFWE2K3 (See credential)	
Machine Learning Engineer Nanodegree , <i>Udacity</i>	<i>Jan 2018 - Present</i>
<ul style="list-style-type: none">• See credential	
Machine Learning , <i>Coursera</i>	<i>July 2017 - Present</i>
<ul style="list-style-type: none">• License EEYYGQPCFLN7 (See credential)	

SKILLS

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)

Prediction for Configuration Bug Report Using Text Mining	<i>Nov 2019 - Dec 2019</i>
<ul style="list-style-type: none">• 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	<i>Dec 2018 - Expected Nov 2019</i>
<ul style="list-style-type: none">• 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.	
Stock Price Prediction Model Based LSTM to Maximize Return on Investment	<i>Oct 2018 - Dec 2018</i>
<ul style="list-style-type: none">• 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	<i>Jul 2018</i>
<ul style="list-style-type: none">• The goal is to find the lane line using advanced techniques.• See project	

Vehicle Detection	<i>Jul 2018</i>
<ul style="list-style-type: none"> • The Software Pipeline to Detect Vehicles in a Video. • See project 	
Clone Driving Behavior	<i>Jun 2018</i>
<ul style="list-style-type: none"> • The goal is to clone driving behavior via the CNN model. • See project 	
Recipe Assistant App	<i>Apr 2018 - Jun 2018</i>
<ul style="list-style-type: none"> • This project is the recipe assistant app which helps people to cook an easy way. • See project 	
Tic-Tac-Toe game for LPC 1768	<i>Jun 2018</i>
<ul style="list-style-type: none"> • This project is the Tic-Tac-Toe Game using ARM Cortex-M3(LPC 1768) • See project 	
Lane Finding Project	<i>Mar 2018</i>
<ul style="list-style-type: none"> • The goal is to find the lane lines on the road. • See project 	
Iceberg Classifier	<i>Jan 2018</i>
<ul style="list-style-type: none"> • 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	<i>Apr 2017 - Jul 2017</i>
<ul style="list-style-type: none"> • This project is the game improvement project in Java. • See project 	
Smart Mailbox	<i>Sep 2017 - Dec 2017</i>
<ul style="list-style-type: none"> • This project is the smart mailbox notifies a user when a new mail arrives at the mailbox. • See project 	