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RESEARCH INTERESTS

Learning and Trying New Areas within DL

Still at the beginner level, I want to open up all possibilities and experience as many different fields as possible.
: Extraction-based Summarization (NLP), Speaker Verification (SV) and Identification (SI), Time Series Forecasting

Balancing Theoretical Knowledge with Practical Experience

It does not stop at simply reading the papers, but directly implements it as a code, applies it in AI Competition, and considers a method for actual service.
: TensorFlow, PyTorch, Flask, MongoDB (Atlas), HTML and Docker

Fields simply for Satisfying Intellectual Needs

Although it may not have much to do with DL, it's an area I'm interested in just because I want to learn.
: Julia Programming, Cryptography (with Abstract Algebra), Object Detection (CV)

EDUCATION

Sejong University, Seoul, Republic of Korea.   Mar. 2014 – Present

Department of Computer and Information Security
Advisor: Prof. Jae Seung Song

KITRI Best of the Best (BoB), Seoul, Republic of Korea.   Jun. 2019 – Mar. 2020

Information Security Leader Training Program: Security Product Development Track (8th)
Advisor: In Hyun Park (IYagiLab Corp.), Hyun Jung Lee (Koscom Corp.)

RESEARCH EXPERIENCE

IYagiLab Co., Ltd., Suwon, Gyeonggi-do   Mar. 2021 – Present

Intern, Backend Developer (advised by In Hyun Park)

- (Ongoing)

(No institution affiliated with)   Mar. – Aug. 2021

Project Manager (advised by Prof. Kyung Gon Kim and Prof. Huy Kang Kim)

- Project [P1], which deals with adversarial attacks on DL-based speaker verification (SV) and identification (SI) systems, is an extension of the previous project [P3], and despite of the lacks of skills, I wanted to study and deal with the DL algorithm itself.
- In this paper, one of the latest models submitted to VoxSRC-20 was selected as a baseline, and fast gradient sign method (FGSM) and projected gradient descent (PGD) attacks were performed on it, showing that the model could be vulnerable to adversarial attacks. The purpose of this is to raise awareness about this by showing that attacks on

DL models are possible for companies and professors who will encounter the paper or will introduce the function. The paper is currently under review, and all codes are published in my github repository.

Sejong University, Seoul, Republic of Korea   Mar. – Sep. 2020

Project Manager (advised by Prof. Ji Sun Shin)

- Project [P4] on speaker verification (SV) and identification (SI) is an extension of the previous project [P5]. During [P5], I was constantly asked why we did not use voice and fingerprint, which were easy to use and ensured stability, and to find an answer, we conducted a study on a personal recognition system using voice. This study was conducted with the support of the school, and it is significant in that it is the first time I have started studying DL.
- This leads to [P3], which is further advanced. Beyond the existing concept of text-dependent (TD) and text-independent (TI), we proposed the concept of text data in which one speaker uttered two or more languages. For Koreans, it was shown that the performance (EER) could be higher when the Korean and English utterances were adjusted to about 3:2 or 4:1, compared to using only the utterances of a single nationality. This study was written and submitted as a thesis [DJ1], and was awarded [A2].

KITRI Best of the Best (BoB), Seoul, Republic of Korea   Sep. – Dec. 2019

Trainee, Project Manager (advised by In Hyun Park and Hyun Jung Lee)

- I conducted research related to personal recognition (including identification and authentication) using biometric indicators. Specifically, I played a project manager (PM) role in a project [P5] related to ML/DL-based personal recognition using an electrocardiogram (ECG), a type of biosignal, and did not directly conduct research. One of the deliverables of the project is [DC1].

AWARD AND HONORS

[A1]   Gold Prize in *7th SW·AI·Convergence Competition* (Sejong University)   Dec. 2020

[A2]   Encouragement Prize in *4th Financial Security Institute Thesis Award*   Nov. 2020

DOMESTIC CONFERENCES

[DC1] K. H. Kim, D. Y. Kim, J. S. Kim, Y. C. Park, I. H. Park, **M. G. Oh**, U. J. Lee, H. J. Lee, J. J. Choi. (2019). Precautions and Related Guidelines while Handling ECG Data for Personal Authentication. In *Conference on Information Security and Cryptography-Winter 2019*. – poster. (alphabetical author ordering)

DOMESTIC JOURNALS

[DJ1] **M. G. Oh**[*], K. H. Kim, H. J. Lee, J. S. Shin[†]. (2020). Research and Development of Speaker Verification System Based on Deep Neural Network assuming Language Independent Method. In *Proceedings of the 4th Financial Security Institute Thesis Award* (pp. 111-124).

PROJECTS

[P1]   (No institution affiliated with). (Mar. – Aug. 2021). Evasion Attack on Deep Neural Network-based Biometric Authentication System Using Voice: Focusing on Qualitative Evaluation and Ablation Studies of Cross-Validation. Participated as a Project Manager and Developer.

[P2] Ministry of SMEs and Startups (MSS), Woowa Brothers Corp., IYagiLab Crop. (Sep. – Oct. 2020). Big-Star Solver Platform 2nd AI Championship Competition: AI Development to Censor Manipulation Cases such as Order Count and Reviews. Participated as a Project Developer.

[P3] (No institution affiliated with). (Jun. – Sep. 2020). Research and Development of Speaker Verification System Based on Deep Neural Network assuming Language Independent Method. Participated as a Project Manager.

[P4] Sejong University Daeyang Humanity College and Software Centered University Business Group. (Mar. – Jun. 2020). Research on Next-Generation Voice Authentication System using Machine Learning. Participated as a Project Manager.

[P5] Korea Information Technology Research Institute Best of the Best (KITRI BoB). (Sep. – Dec. 2019). A Measures to Activate ECG Recognition to Improve Financial Services for the Blind. Participated as a Project Manager.

AI COMPETITIONS

[C1] National Information society Agency (NIA), EUCLIDSOFT, DACON. (Sep. – Oct. 2021). 2021 Ego-Vision Hand Gesture Recognition AI Competition. Rank - / - (%). (ongoing)

[C2] National Intelligence Service, National Security Research Institute, DACON. (Aug. – Nov. 2021). AI Challenge for Industrial Control System Threat Detection. Rank - / - (%). (ongoing)

[C3] LG AI Research, DACON. (Jun. – Aug. 2021). Solving Glare on a Camera AI Competition. Rank 97 / 228 (42.54%).

[C4] DACON. (May. – July. 2021). Nationality Classification by English Speech. Rank 41 / 73 (56.16%).

[C5] DACON, Korea Polar Research Institute (KOPRI). (Feb. – Apr. 2021). Satellite Image Arctic Sea Ice Prediction AI Competition. Rank 106 / 107 (99.07%).

[C6] Ministry of Science and ICT (MICT), National Information society Agency (NIA), Plani. (Jan. – Feb. 2021). 2021 Abnormal Behavior Recognition Algorithm Development Competition. Rank 7 / 14. (50.00%)

[C7] Innopolis Foundation, Korea Atomic Energy Research Institute (KAERI). (Dec. 2020 – Jan. 2021). Prediction of Solar Power Generation AI Competition. Rank 60 / 461 (13.02%).

[C8] Korea Polar Research Institute (KOPRI), AI Factory. (Nov. – Dec. 2020). Satellite Image Arctic Sea Ice Prediction Algorithm Competition. Rank 2 / 4 (50.00%).

[C9] Sejong University Software Centered University Business Group. (Nov. 2020). The 7th SW·AI·Convergence Competition (Artificial Intelligence Challenge). Rank 1 / 25 (4.00%).

[C10] Seoul National University AI Researcher, Seoul National University AI Lab (DSAIL), Money Brain. (Oct. – Nov. 2020). Deep Fake Modulated Video Detection AI Competition. Rank 22 / 68 (32.35%).

[C11] Korea Hydro & Nuclear Power Co., Ltd. (Oct. – Nov. 2020). AI Competition for Prediction of Rainfall in Hydroelectric Dams Using Public Data. Rank 64 / 132 (48.48%).

[C12]   DACON. (Sep. – Nov. 2020). Psychological Prediction AI Competition. Rank 260 / 581 (44.75%).

[C13]   DACON. (Aug. – Sep. 2020). Computer Vision Learning Competition. Rank 1 / 355 (0.28%).

[C14]   National Security Research Institute. (Aug. – Sep. 2020). Industrial Control System Security Threat Detection AI Competition (HAICon 2020). Rank 191 / 265 (72.08%).

[C15]   DACON. (Jun. – Aug. 2020). Voice Overlaid Data Classification AI Competition. Rank 4 / 83 (4.82%).

LICENSES AND CERTIFICATIONS

[L1]   Driving License of Crane in *Ministry of Land, Infrastructure and Transport*   Nov. 2018

[L2]   Driving License of 1st Class (Regular) in *Seoul Metropolitan Police Agency*   Nov. 2018

[L3]   Craftsman Crane Operator in *Ministry of Land, Infrastructure and Transport*   Feb. 2018

MILITARY SERVICE

[M1]   Served and discharged upon completing military service as a sergeant.   Jun. 2016 – Mar. 2018.