

# Graduate School of Science and Technology Master's Thesis Abstract

Laboratory name (Supervisor)	Natural Language Processing (WATANABE TARO (Professor ))		
Student ID	2111304	Submission date	2023 / 1 / 19
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Thesis title	Conjugating Parameters for Knowledge Graph Embeddings in Complex Space		
Abstract			
<p>A Knowledge Graph (KG) is the directed graphical representation of entities and relations in the real world. KG can be applied in diverse Natural Language Processing (NLP) tasks where knowledge is required. The need to scale up and complete KG automatically yields Knowledge Graph Embedding (KGE), a shallow machine learning model that is suffering from memory and training time consumption issues. To mitigate the computational load, we propose a parameter-sharing method, i.e., using conjugate parameters for complex numbers employed in KGE models. Our method improves memory efficiency by 2x in relation embedding while achieving comparable performance to the state-of-the-art non-conjugate models, with faster, or at least comparable, training time. We demonstrated the generalizability of our method on two best-performing KGE models 5*E and ComplEx on five benchmark datasets.</p>			