

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

Laboratory name (Supervisor)	Mathematical Informatics (Kazushi Ikeda (Professor ))		
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Thesis title	Neural Efficiency in Program Comprehension and Expertise		
Abstract			
<p>Program comprehension is a crucial skill in today's information age, essential for training new programmers and enhancing the abilities of existing ones. Existing research in the field links program comprehension to cognitive functions such as the division of attention, language processing, and working memory. Notably, specific neural activity associated with expert programmers has been identified. Building on the neural efficiency hypothesis, which posits that individuals with higher cognitive abilities exhibit lower brain activation during cognitive tasks, our research explores the efficiency of neural processes in programmers during program comprehension tasks, especially across different expertise levels. The study aims to reveal insights into how the programmer's brain optimises the use of neural resources to efficiently perform program comprehension tasks. Our results demonstrate that highly skilled programmers exhibit neural efficiency in handling less complex cognitive tasks compared to their less skilled counterparts.</p>			