論 文 の 内 容 の 要 旨

論文題目　A Contract-based Programming Model for Distributed Computing
(分散コンピューティングのための契約に基づくプログラミングモデル)

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Once restricted to research, academic, and corporate environments, distributed computing is becoming an important part of the daily life of the average person. The multiplication of mobile devices and the raise of ubiquitous high speed networks in urban centers is rapidly broadening the reach of distributed systems. In this scenario, it is imperative to rethink the way we write such systems. Are our programming models adequate to new paradigms such as cloud computing? How can we avoid vendor lock-in for complex service interfaces? The answer is perhaps by using service contracts that can reflect not only message formats, but that also describe agent behaviors. In this research we address this problem using two methods. On the first, we apply finite state machines and matrices to represent agent states. On the second approach, we expand this idea and use the π-calculus to represent processes that can dynamically create new connections between agents, and that can pass connections along communications. We also created a prototype implementation of a message-oriented middleware to prove our concept. We found that our approach can easily allow for programmers to have their agents checked for interaction issues before deployment, which we believe greatly reduces the cost of development and the quality of generated systems.