



2008 年度下期未踏 IT 人材発掘・育成事業 採択案件評価書

1. 担当PM

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2. 採択者氏名

チーフクリエイター: 中野 賢 (University of California, Irvine Department of Computer Science)

コクリエイター: なし

3. プロジェクト管理組織

学校法人国際大学 (グローバル・コミュニケーション・センター)

4. 委託金支払額

4,988,000 円

5. テーマ名

Development of an Evolutionary Agent-based Network Simulator

6. 関連Webサイト

なし

7. テーマ概要

Computer networks today are rapidly growing in size and complexity. A recent network potentially contains millions of nodes with different

computing and networking capabilities that may dynamically leave and join such a network. A key challenge here is to design a network that is scalable, adaptive and robust, and that operates autonomously to minimize operational and maintenance costs. In this project, the creator develops a network simulator that can be used to design an agent-based autonomous network. The specific goal is to develop a scalable network simulator that can simulate 10,000 to 100,000 interacting agents on a large scale network. The creator also develops an easy-to-use graphical user interface for designing agent-based networks. The creator also develops built-in functions to simulate typical network conditions (e.g., typical network topologies and workload patterns) as well as a set of libraries for extending the functions. The simulator will be made publicly available on the Internet, and in the long run, it is expected that the simulator is used to design new network services and solutions.

8. 採択理由

I have very mixed feelings toward this effort. While the idea of agent based systems is very interesting (and has been since the 1970s in local environments) I have serious concerns about building a simulator. It is not that simulators are not good but I have a concern that the effort will not lead anywhere. It is just too easy to create a real environment on today's networks using today's large-scale distributed environments.

That being said I would not veto this effort. It is well thought out and would contribute to this area but I still am very concerned what real contribution it will make as opposed to real experiments.

9. 開発目標

The project goals were to develop a network simulator that is scalable, extensible and user-friendly. To develop a scalable network simulator, the low level detail of networks is simplified and simulator program codes are optimized. To make a network simulator extensible, the network simulator is designed based on a modular architecture and detailed design documents are provided. Further, to improve the usability, the network simulator is tested and evaluated by third persons and necessary functions identified are added to the simulator. The

simulator should be able simulate more than a million of autonomous agents, on a large-scale network consisting of a minimum 10,000 nodes. The simulator should be based on a modular architecture with full design documents and user manuals provided so that third parties can easily extend and further develop the simulator. Usability of the simulator should be enhanced by testing with other research groups and individuals.

10. 進捗概要

The major milestones of the project were achieved ahead of schedule and the project completed one month in advance of the overall schedule with the major milestones reached. The developer was able to include testing and use by third party researchers, and has had a paper on the subject of the project accepted at a conference, Globecom 09, so satisfying another non-technical goal of the project.

11. 成果

The three goals of the project: scalability, extensibility and usability if the agent based network simulator were achieved ahead of schedule. The project was skillfully managed, documentation completed and testing done with third parties, with a mature professional approach that indicates a string career ahead.

12. プロジェクト評価

The result of the project is a rather professional product which is being used by a number of researchers. As knowledge of this simulator becomes more widespread and as the documentation becomes more available, one would believe that this could be a major help in designing such systems.

I would recommend that some effort be undertaken to help advertise to the community the availability of this product. I was very impressed with the developer's professionalism and believe that he will have a profitable career in front of him in that part of his long-term success was helped by this budget and support of the IPA program.

13. 今後の課題

There is further work to be done to complete the applet version of the simulator, which at the time of completion of the project does not load on a web browser.