



Goddard and LogicNets Collaborate in the Building of a Test-bed Environment for an Intelligent Robotic System



A new agreement between NASA Goddard Space Flight Center and LogicNets, Inc., is enabling collaborative development of an intelligence modeling and runtime environment for autonomous robotic systems. These intelligence models will be embedded into a variety of vehicles and will control the vehicles during various missions and tasks in different environments. The test-bed framework will also provide a means for testing new exploration technologies, procedures, and techniques. Potential applications for intelligent autonomous vehicles are vast, including mapping, exploration, and monitoring of land and water surfaces on Earth as well as unknown planetary surfaces.

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Benefits of Technology Transfer

- NASA will benefit by applying the robotic system to exploration of the Moon, Mars, and Jupiter's moon Europa as well as potential exploration of other planetary surfaces.
- NASA will be able to test any number of robotic vehicles using the new system without having to first invest the time and expense in hard coding each potential vehicle.
- In a modular and plug-and-play manner, NASA will be able to test new instruments, sensors, algorithms, and procedures independent of the vehicle being used.
- LogicNets will be able to apply the new, tested robotic system to other industries such as manufacturing as well as the automotive and airline industries, among others.
- The general public may benefit from a new, flexible, and economical technology that will enhance search-and-rescue operation missions as well as tracking and monitoring of dangerous environmental agents, homeland security operations, and others.

tech transfer success

On the Record

“The IPP Office has been extremely helpful. During the process we had numerous questions and concerns, which were addressed immediately and the IPP Office worked with us to make the [agreement] work for both organizations.” – *Jelle Ferwerda, President and CEO, LogicNets*

“Building this standardized framework would be much more time consuming, difficult, and expensive for NASA to do on its own. This is a huge driving force behind technology transfer agreements.” – *Patrick Coronado, Innovator, NASA Goddard*

About LogicNets

LogicNets (www.logicnets.com) has provided an easy-to-use, affordable online knowledge automation software platform since 1999. Based in Washington, D.C., the company serves customers in North America and Europe, providing the ability to distribute expertise to thousands of users as professional Web services.

Innovation Through Collaboration

Looking for new methods of exploration on the Moon, Mars, and Europa (one of Jupiter’s moons), Goddard scientists are researching many different autonomous robotic vehicles. Custom-making each vehicle, including hard coding procedures, would be very cumbersome, tedious, and expensive. Researchers need a uniform, consistent, standardized framework in which to test the vehicles without committing time and funds to coding everything about the vehicles and their environment.

Working with LogicNets, NASA Goddard scientists will develop an artificial intelligence (AI) test-bed with the capability to predict if/how a vehicle will work in various exploration scenarios before time and funds are committed to vehicle development and mission deployment. Based on LogicNets’ expert system application modeling and runtime environments, the system will also be able to control real vehicles and to make the decisions for the interaction between the robotic vehicle systems and the environment. Goddard will contribute software procedures and rules to develop the robotic test system, thereby populating the LogicNets framework with vehicle and environmental information and parameters for testing. The two organizations will also collaboratively test learning algorithms and develop a software framework independent of any specific type of vehicle.

The Transfer Process

LogicNets has been working for many years on its main product, which creates procedural models for the business world using an expert runtime environment. Goddard was looking for a company with expertise in this area and a product that could evolve into an

autonomous system for robotic vehicles. Goddard was also seeking a company with motivation to invest its own resources in developing an AI test-bed that would be applicable to NASA and had the flexibility for growth to accommodate new vehicles, vision systems, sensors, actuators, and other technologies that NASA may deploy for future missions. LogicNets was one of few companies that fit the bill. Working diligently with Goddard’s Innovative Partnerships Program (IPP) Office, Goddard scientists and LogicNets arrived at an agreement that is mutually beneficial. The work performed under the nonreimbursable Space Act Agreement signed in March 2007 will answer NASA’s need for a robotic vehicle test system while increasing LogicNets’ competitive advantage and potential market penetration.

Looking Ahead

With an agreement in place, researchers at both organizations are collaborating to develop a robotic system that can be defined and tested in any exploration scenario. They expect the work to take at least two years to complete, at which time testing and evaluation may be followed by implementation in NASA exploration missions.

For More Information

If you would like additional information about Goddard’s technology transfer opportunities, please contact:

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