A DYNAMIC CLUSTERING CONSTRUCTION FOR WIRELESS SENSOR NETWORKS

Eugene Pamba Capo-Chichi, David Martins, Hervé Guyennet and Violeta Felea
University of Franche-Comté
Besançon, France

ABSTRACT

Research in sensor networks has focused on development of energy efficient infrastructures. In this article, we introduce a new approach to organize sensor networks in clusters in order to reduce energy dissipation. Our contribution is an heuristic to define the number of clusters and also an efficient manner to choose cluster heads by minimizing the distance between cluster heads and its cluster nodes. Inspired from LEACH, a well-known TDMA cluster-based sensor network architecture, we introduce a new method for building and maintaining clusters using the paradigm of a soccer team. In this work, a new algorithm called OH-Kmeans, based on the K-means algorithm, is used to find dynamically the number of clusters and form them, guaranteeing direct transmission between cluster heads and cluster nodes.

UNIVERSAL MONITORING PLATFORM FOR INTERACTIVE REAL-TIME EXPANSIVE NETWORKS (UMPIRE)

David Bridges and Shervin Mostashfi
Peerless Technologies Corporation
Fairborn, Ohio, USA

ABSTRACT

Peerless Technologies Corporation and team members Clear Creek Applied Technologies (CCAT) and Science Applications International Corporation (SAIC) propose our exclusive uniform, yet extensible, virtual platform, namely Universal Monitoring Platform for Interactive Real-time Expansive networks (UMPIRE) to enable Department of Defense (DoD) to monitor the health of distributed simulation networks (e.g. Global Information Grid (GIG)) that include Live, Virtual and Constructive components (LVC). Our team will design and develop a methodology and test plan for handling the real-time monitoring of networked LVC components in a geographically distributed secure simulation environment and a proof-of-feasibility demonstration of key enabling concepts. Based on cutting-edge technologies available, our team envisions the provision of indispensable support to any current or future national security related endeavors partaken by the DoD. Considered as
immediate aspirations for this effort, Research and development will concentrate on novel mechanisms, methodologies, and advanced collaboration technology to monitor the health of distributed simulation networks.

Presenters’ Biographies:

David Bridges holds a Bachelors of Science in Business with a concentration in Management Information Systems from Wright State University in Dayton, Ohio. Mr. Bridges has nearly four years of experience in the IT industry and currently holds the position of Software Engineer and Systems Administrator with Peerless Technologies Corporation.

Shervin Mostashfi holds a Bachelors of Science in Electrical Engineering with a concentration in Control Systems from Wright State University in Dayton, Ohio. Mr. Mostashfi currently holds the position of Systems Engineer with Peerless Technologies Corporation.

SPRUCE: SYSTEMS AND SOFTWARE PRODUCIBILITY COLLABORATION AND EVALUATION ENVIRONMENT

Patrick Lardieri, Rick Buskens, Srini Srinivasan
Lockheed Martin Advanced Technology Laboratories
Cherry Hills, New Jersey, USA

Bill McKeever, Steve Drager
Air Force Research Laboratory
Rome, New York, USA

ABSTRACT

SPRUCE (Systems and Software Producibility Collaboration and Evaluation Environment) is an open web portal and experimentation environment to bring together Department of Defense (DoD) software developers, users, and software engineering researchers by collaborating on specifying and solving software producibility challenge problems. The SPRUCE approach emphasizes collaboration around well-defined challenge problems with project-specific artifacts representative of DoD projects and experimentation for reproducing the stated problems, establishing benchmarks and evaluating solutions.

This poster illustrates SPRUCE’s key features, including self-organizing communities of interest (CoI), dynamically evolving challenge problems with accompanying artifacts, and built-in experimentation facilities to reproduce the problems and evaluate solutions. Finally, it showcases some early experiences and results with representative challenge problems.

Presenter’s Biography:

Richard Buskens is a Manager of Advanced Software Technology Research at Lockheed Martin Advanced Technology Laboratories (ATL). He has over 18 years of Software Engineering experience. Since joining Lockheed Martin in October 2006, Dr. Buskens has assumed the role of technical program manager of Lockheed Martin’s Software Technology Initiative, which aims to demonstrate innovative technologies that can lead to software development that is five times faster and one-fifth the cost of current software development methods. Dr. Buskens is the principal investigator for the ATL team’s participation in AFRL’s Systems and Software Test Track Phase II program, called SPRUCE. Prior to joining LM ATL, Dr. Buskens worked at Bell Laboratories for 12 years in a variety of capacities including leading a 30-person team focused on software engineering technology research. Several of the technologies developed were transitioned into/adopted by Lucent Technologies product units.