TreMonti

A Method for Cyber-Robust Computer Control System

Contact
Michael Kress
TreMonti Consulting, LLC
2944 Hunter Mill Rd., Ste. 204
571 594 0835 - cell
mkress@tremonticonsulting.com

Inventor
Charles J. Kim, Ph.D

Field
Electrical and Computer Engineering

Technology
Computer Control System
Cyber-Security

Key Features
- Only One-way communication, the existing system is not touched
- Easily integrated within existing computer control systems
- Easily adapted to a variety of computer control systems

Stage of Development
Lab test of proof of concept can be demonstrated

Status
Seeking development & licensing partner.

Patent Status
Provisional Patent application filed

Technology
Howard University has developed a cyber-resilience approach that makes networked computer control systems substantially immune to cyber incidents. Cyber incidents may be originated from malicious cyber attackers, random or design hardware/software problems in the computer controllers, sabotage from a disgruntled employee, or inadvertent mistakes. The inventive approach includes a redundant computer controller assigned a duplicative control function in a different hardware using different software, *e.g.*, using a different programming language, to insure cyber fail-safe operation even under the situation of cyber attack and infiltration.

Benefits of the Technology
The current focus on the cyber-security for computer control systems is centered on security measures that are relevant only to known attack vectors and behavior. The current practices, however, ignore the plain truth that it is impossible to predict cyber events throughout the computer controller's lifecycle. The fail-over operative benefit of the proposed approach is apparent in its strength and resiliency under a cyber-attack or other comprised situation though use of the diversified redundant architecture. This redundant architecture provides immunity to malicious changes and modifications to the existing computer control systems.

Potential Application for Technology
This inventive approach can be applied to all computer control systems that are networked or accept connections to any outside device such as thumb drives and are thus under threat of potential cyber-attack throughout their life cycles. This diversified hardware and software disposition allows strength against any cyber and network related incidents, attacks, errors, and common mode failures, and thus allows a control system to survive and operate normally in virtually any situation.

Stage of development
An initial lab test has been completed for a proof of concept.

Opportunity
Howard University is looking for a commercial partner to further develop this system.

TreMonti

A Method for Cyber-Robust Computer Control System

Contact
Michael Kress
TreMonti Consulting, LLC
9302 Lee Highway, Suite 306
Fairfax, VA 22031
571 594 0835 - cell
mkress@tremonticonsulting.com

Inventor
Charles J. Kim, Ph.D

Field
Electrical and Computer Engineering

Technology
Computer Control System
Cyber-Security

Key Features
- Only One-way communication, the existing system is not touched
- Easily integrated within existing computer control systems
- Easily adapted to a variety of computer control systems

Stage of Development
Lab test of proof of concept can be demonstrated

Status
Seeking development & licensing partner.

Patent Status
Provisional Patent application filed

INVENTOR

Charles J. Kim, Ph.D.
Professor
Howard University
Department of Electrical & Computer Engineering

EDUCATION

Ph.D., Electrical Engineering, Texas A&M University, 1989
M.S., Electrical Engineering, Seoul National University, 1982

SPECIALTY

Power Electronics and Computer Applications, Power System Automation and SCADA, Predictive Maintenance and Diagnostics, Artificial Intelligence Applications, AM/FM/GIS and Electric Fire Investigation