Chapter 47
Distributed System Implementation Based on "Ants Feeding Birds" Algorithm:
Electronics Transformation via Animals and Human

Preeti Mulay

https://orcid.org/0000-0002-4779-6726
Symbiosis Institute of Technology, India

Krishnal Patel

Symbiosis Institute of Technology, India

Hecto Gomez Gauchia

University of Madrid, Spain

ABSTRACT

Evolving technologies are intricately woven into the fabric of social and institutional systems. With the invent of "Internet of Everything (IoE)" concept it is realistic now to employ animals and or humans to transmit details electronically. IoE concepts with sensor technology can prove wonders in any domain for that matter starting from eFarming, eHealth, eCare and what not. Humans can transform electronics by using various eConnected gadgets also motivated due to or based on "Nature Inspired Algorithms". The confluence of IT, psychology with non-IT systems will be part of new generation's life. Such collaborative concept can be implemented practically with the help of "Cloud-to-Dew-Computing" based technologies. To include so many concepts together, it is essential to concentrate also on Cyber Security and Risk associated with such conceptual implementation. Dew-Computing at root levels will take care of Cyber Security effectually. Dew-Computing being backend support of Distributed System, can process multiple entities resourcefully. "Animal Data Interchange Standards" are very well considered innovative business opportunity these days and for years to come. These standards have started their work focusing on the Dairy related animal standard. Every dairy animal should enjoy life to remain healthy and more productive. Incremental Learning about Animal Life Data and Animal Identification, behavior, seasonal-changes, health etc. can be easily achieved with IoE.

INTRODUCTION

A paradigm shift is practically implemented in various dairy, agricultural related businesses, with a combination of Sensors, RFIDs usages, Business intelligence, Mobile technology, Cloud Computing etc. Get to leverage technology to help rural masses who have been left out of the technological progress we have seen in the cities. According to the United Nations' Food and Agriculture Organization, food production must increase 60% to be able to feed the growing population expected to hit 9 billion in 2050. The global food challenge necessitates that farmers find new sources of productivity by concentrating on herds of animals & their feeding regime, the effect of seasonal changes on animals, grass growth details in farm, soil nutrition management, livestock performance, etc.

For 50 years, scientists searched for the secret to making tiny implantable devices that could travel through the bloodstream. Engineers at Stanford have demonstrated just such a device. Powered without wires or batteries, it can propel itself through the bloodstream and is small enough to fit through blood vessels (Ada et al 2015, 2016).

Technology influences, and is influenced by, the socio-structural nature of societies. The extraordinary advances in electronic technologies, global human interconnectedness presents novel adaptational challenges and expanded opportunities for people to shape their life with ease and best utilization of IT. "Human Generated Power for Mobile Electronics" is booming up the field, using wearable technology without physical implants. It is observed by researchers that the human joints are also a good source of generating energy and hence a device with sensors, able to capture energy is attached at the elbow in the form of a jacket. The precaution is taken while designing this jacket that the weight of jacket does not increase with this addition and yet gives information about store energy, which can be further used for mobile charging (Thad et al 2015). Soles of shoes extensively used during walking, running etc to harvest human motions is successfully experimented by Prof. Sangtae Kim MIT to power sensors and wearable gadgets.

Privacy-preserving in itself is the major research area. It is related to data generated due to transformation of human and animals, directly (by pervasive computing way) or indirectly (by simulation and use of technology extensively) includes securing the authenticity and integrity of context information and creating a secure context distribution algorithm, protection of roles and role-based access control by pervasive applications during distribution in any environment, a secure key-exchange mechanism that can be used to secure the communication between users and devices and automatic generation of a privacy policy.

A novel integrated approach to Multilaterally Secure Pervasive Cooperation as well as the supporting security techniques and mechanisms consists of threshold encryptions, location traces, end to end confidential messaging with anonymous receivers used for querying human sensors connected with mobile devices.

To achieve electronic transformation indirectly via human by taking inspiration from nature is amazing to realize and implement in the form of a novel conceptual algorithm using multi-robots. Multi-robot cooperation includes joint collaborative behaviour that is directed towards some goal in which there is a common interest or reward.

A nature inspired real story of *"ant feeding birds"* during recent summer drought is successfully converted into an algorithm. This algorithm is then mapped into real world scenarios, wherein a lot of dependencies of human on IT network is automated using multi-robots, and in another scenario related to automation; handshake among various entities is successfully and securely achieved. The first sce-

Related Content

Cyber Security Vulnerability Management in CBRN Industrial Control Systems (ICS)
Roberto Mugavero, Stanislav Abaimov, Federico Benolliand Valentina Sabato (2020). *Cyber Warfare and Terrorism: Concepts, Methodologies, Tools, and Applications (pp. 931-963).*
www.irma-international.org/chapter/cyber-security-vulnerability-management-in-cbrn-industrial-control-systems-ics/251472

Preparing for Cyber Threats with Information Security Policies
Ilona Ilvonenand Pasi Virtanen (2013). *International Journal of Cyber Warfare and Terrorism (pp. 22-31).*
www.irma-international.org/article/preparing-for-cyber-threats-with-information-security-policies/105189

Toward a U.S. Army Cyber Security Culture
Christopher Pauland Isaac R. Porche (2011). *International Journal of Cyber Warfare and Terrorism (pp. 70-80).*
www.irma-international.org/article/toward-army-cyber-security-culture/69773

Functioning of Terrorism
Dana Janbek (2014). *Exchanging Terrorism Oxygen for Media Airwaves: The Age of Terroredia (pp. 144-156).*
www.irma-international.org/chapter/functioning-of-terrorism/106158

Towards an Index of Fear: The Role of Capital in Risk´s Construction
Maximiliano E. Korstanje (2014). *International Journal of Cyber Warfare and Terrorism (pp. 19-26).*
www.irma-international.org/article/towards-an-index-of-fear/110979