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Research Areas

The group explores research areas such as computer and system security, including:

1. Cryptography and protocols
2. Access control
3. Quantum key distribution
4. Steganography and information hiding
5. Network and Communication Security
6. Intrusion detection systems
7. Digital Forensics
8. Software security
9. Malware Analysis
10. Information Security Management

Collaborators

MIMOS Bhd.
CyberSecurity Malaysia
1Machine Sdn. Bhd.
MediaCrypt Resources Sdn. Bhd.
EC-Council Academy
Information Security Professionals of Malaysia (ISPA.my)



INFORMATION SECURITY GROUP

Faculty of Computer Science
and Information Technology

Universiti Putra Malaysia

Overview

Computer security is crucial in almost any technology-driven industry which operates on computer systems, as enormous volumes of critical information is created, transmitted, and archived by computers worldwide every day – ensuring the security of this information is a challenge. Some of this information can be confidential ones belonging to governments, military, financial institutions, hospitals, and private businesses. Protecting confidential information is crucial indeed – it is undoubtedly a business requirement, and in many cases also an ethical and legal requirement.

Information security involves protecting information and information systems from unauthorized access, use, disclosure, disruption, modification, or destruction. With the ever-growing technology, today's computer professionals need a comprehensive understanding of all aspects of security in computing.

Why study Computer Security at UPM?

We at UPM offer/provide:

- well trained experts in the information security systems area to guide ambitious research students to conduct research.
- well established programmes that have produced a number of successful PhD and Master graduates.
- well equipped with good and latest IT facilities that provide comfortable environment for ambitious research students to conduct research.
- most of the experts in the information security group are awarded with research grants.

Recent Projects/Grants

A Hybrid Multibiometric Continuous Authentication Framework Based on Shielding Functions and Non-Invertible Transformation

Nur Izura Udzir, Ramlan Mahmud, Azizol Abdullah, Shukor Abd Razak, Norziana Jamil; FRGS, RM 71,000, Nov 2015 – Oct 2017

Enhanced Tight Finite Key Scheme For Quantum Key Distribution (QKD) Protocol To Authenticate Multi-Party System In Cloud Infrastructure

Zuriati Ahmad Zukarnain, Azizol Bin Abdullah, Hishamuddin Zainuddin, Zurina Binti Mohd Hanapi, Nur Izura Udzir, FRGS, 01/12/2013 - 30/11/2016, RM76,600

Intrusion Detection with Hybrid Learning Algorithm

Nur Izura Udzir, Zaiton Muda, Md Nasir Sulaiman, Warusia Mohamed; RUGS, RM 39,000, Nov 2012 – Oct 2014

Ensemble Mobile Platform for Innovative Digital Economy Environmental - Digital Forensic Investigation for Honey-Bee Computing Environment

Ramlan Mahmud, Nur Izura Udzir, Zuriati Ahmad Zukarnain, Mohd Taufik Abdullah; LRGS, RM 82,000, Aug 2011 – Jul 2013

Immune-Inspired Cryptographic Model

Ramlan Mahmud, Fakhariah Hani Mohd Ali, Mohd Reza Za'ba, Suriyani Ariffin; FRGS, RM 115,000, Aug 2011 – Aug 2014

A New Key-Dependent Block Cipher Cryptanalysis {-1, 0, 1, 3}-NAF Scalar Multiplication Algorithm for Elliptic Curve Over Binary Field

Sharifah Md. Yasin, Ramlan Mahmud, Zaiton Muda, Mohd Hasan Selamat; RUGS, Oct 2011 - Oct 2013

A Linear-Temporal Formal Language for Context-Sensitive Security Policies in Cloud Computing

Ramlan Mahmud; Science Fund, Aug 2011 – Jan 2013

A Linear-Temporal Formal Language for Context-Sensitive Usage Control Policies

Nur Izura Udzir, Ramlan Mahmud, Zuriati Ahmad Zukarnain; FRGS, March 2011 – Feb 2012

Enhancement of Rijndael Key Scheduling on Bit Confusion and Diffusion

Zaiton Muda, Ramlan Mahmud, Sharifah Md. Yasin, Salasiah Sulaiman; RUGS, Aug 2011 - Feb 2013

A New Approach for Better Data Encryption Based on Synchronous Stream Cipher

Zaiton Muda, Ramlan Mahmud, Nur Izura Udzir, and Sharifah Md. Yasin; RUGS, 15 Apr 2011 – 15 Apr 2013

Detection and Prevention Mechanism for DBMS against SQL/XML Injection v. Vulnerabilities in Web Services Environment

Lilly Suriani Affendey, Nur Izura Udzir, Aziah Asmawi; RUGS, April 2011 – April 2013

Secured Routing Protocol for Wireless Sensor Network

Zurina Mohd Hanapi, Raja Azlina Raja Mahmud, Sazlinah Hasan; RUGS, April 2011 – March 2013

Advanced Intrusion Detection System in Mobile Ad-Hoc Networks

Raja Azlina Raja Mahmood, Zurina Mohd Hanapi, Sazlinah Hasan, Noridayu Manshor; RUGS, April 2011 – March 2013

... and more...

Patents

1. "Enable Non-Trusted Application to Utilize TPM using Trusted Application (TAS)", Ramlan Mahmud, 2010
2. "Method, System & Program Product for Remote Execution of an Application Through Trusted Party as a Host", Ramlan Mahmud, 2010
3. "A Method for Securing Data Storage", Ramlan Mahmud, 2010.
4. "A Construction of Key-Dependent MDS Matrices", Ramlan Mahmud, 2010
5. "A Secure System and Method for Access Control", Ramlan Mahmud, 2010
6. "Apparatus and Method to Manage Inter-Communication between Compartments using Trusted Hypervisor/Visualization Tunnel Controller", Ramlan Mahmud, 2010
7. "System and Method to Transform Text into Image for Information Hiding", Ramlan Mahmud, 2010
8. "A formal language for context-sensitive privacy policies", Ramlan Mahmud, Nur Izura Udzir, Zuriati Ahmad Zukarnain, Ali Dehghantanha, 2010
9. "A Formal Language for Describing, Comparing, and Constrasting Context-Dependent Policies", Ramlan Mahmud, Nur Izura Udzir, Zuriati Ahmad Zukarnain, Ali Dehghantanha, 2010