VOLUME 3, EDITION 2 SUMMER 2010

CENTER FOR SECURE CYBERSPACE

UPCOMING EVENTS:

Call For Papers
September 1, 2010

Fall 2010 Classes Begin
September 9, 2010

3rd Cyberspace Research workshop
November 15, 2010

Air Force Global Strike Command Symposium
November 16-17, 2010

PENNSTATE 1855

THE UNIVERSITY of TENNESSEE CHATTANOOGA

LOUISIANA TECH UNIVERSITY

COLLABORATING IN CYBERSPACE

LSU LOUISIANA STATE UNIVERSITY

ABOUT THE CENTER

About the CSC:

The Center for Secure Cyberspace (CSC) is a joint venture between Louisiana State University (LSU) and Louisiana Tech University (La Tech) created to assist faculty members in their research, and to support federal, state and private sector cyberspace security needs in collaboration with the Cyber Innovation Center (CIC) in Bossier City.

Located on the campus of La Tech, the CSC capitalizes upon world-class resources of the Louisiana Optical Network Initiative (LONI), Louisiana Tech's Institute for Micromanufacturing (IFM), and Louisiana State University's Center for Computation and Technology (LSU-CCT).

Purpose of the CSC:

The goal of the Center for Secure Cyberspace is to establish a National Center of Excellence dedicated to education and research in integrated smart cybercentric sensor surveillance systems.

Research Focus Areas:

1) Dynamic Network Formulation
2) Secure Information Dissemination
3) Data Fusion and Prediction of Disaster Precursors
4) Visualization and Validation

Research Team Members

Dr. Vir Phoha, Louisiana Tech University

Dr. S.S. Iyengar, Louisiana State University

Dr. Gabrielle Allen, Louisiana State University

Dr. Travis Atkison, Louisiana Tech University

Dr. Kiran Balagani, Louisiana Tech University

Dr. Peter Chen, Louisiana State University

Dr. Christian Duncan, Louisiana Tech University

Dr. Jean Gourd, Louisiana Tech University

Vasanth Iyer, Louisiana State University

Dr. Jinko Kanno, Louisiana Tech University

Dr. Md. Enamul Karim, Louisiana Tech University

Dr. Joseph Kizza, University of Tennessee @ Chattanooga

Dr. Tevfik Kosar, Louisiana State University

Dr. Supratik Mukhopadhyay, Louisiana State University

Dr. Asok Ray, Pennylvania State University

Dr. Rastko Selmic, Louisiana Tech University

Dr. Greg Vert, Texas A&M University

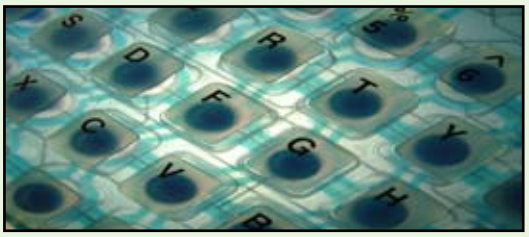
Dr. Jian Zhang, Louisiana State University

WHAT'S HAPPENING?

The Louisiana Tech Campus is dotted these days with signs of progress in Research and Development. Faculty, staff and students are beginning to see the first building of the Enterprise Campus as it continues it's climb to completion.

Tech Pointe will be a 42,000 s/f multi-tenant facility designed to support high-tech companies. It will also feature leisure amenities such as an exercise facility, lounges and break rooms to support companies with operations 24/7.

Tech Pointe will house the Center for Secure Cyberspace and it's Cyberspace Research Laboratory. This laboratory will provide computing and networking facilities. The estimated date of completion for the facility is January of 2011.



Cyber Discovery Camp: Gimmie An A! Gimmie A D! Gimmie A G! ATKISON - DUNCAN - GOURD

From May 31 - June 4, 2010, Louisiana Tech University and the Cyber Innovation Center sponsored the 3rd Annual Cyber Discovery Camp funded by the Department of Education. Twenty area high school teachers and sixty of their students participated with members of the College of Engineering and Sciences (COES).

Professors Travis Atkison, Christian Duncan and Jean Gourd of the Center for Secure Cyberspace (CSC) and COES, teamed with the College of Liberal Arts to develop a residential camp experience aimed at providing a full week on campus of demonstrations of the benefits and dangers of cyberspace.

The camp introduced teachers to integration of cyber into every element of the classroom in every subject, promoting awareness in technology and cyberspace duing an immersive week of on-hand facilitation in the University environment.

The week ended with Benton High School taking top honors for the 2010 Cyber Discovery Camp. Ruston High School came in second place, and Parkway High School took third place. These teams received awards donated by the Cyber Innovation Center. This year's awards included funds available to enhance their school's technology, and twenty computers used during the camp as a donation by Dell.

2010 SYMPOSIUM THEMES

AFGSC 2010 Symposium

The Cyber Innovation Center and the Air Force Global Strike Command will co-host the first Air Force Global Strike Command Technology and Innovation Symposium at the Shreveport Convention Center in Bossier City - Shreveport, Louisiana on November 16 and 17, 2010.

The Symposium is being held in conjunction with the Air Force Global Strike Command's Global Strike Challenge, and is an opportunity to develop relationships and exchange ideas with Industry and Academia that support the Air Force's newest Command. The Symposium will focus on current and future concepts within the nuclear enterprise essential to supporting the AFGSC mission. Symposium attendees will be offered a variety of topics ranging from educating the next generation of Air Force nuclear experts to nuclear safety and research and development updates. There will also be forums and panel discussions with presentations from Air Force and Department of Defense officials instrumental in the formation of Air Force Global Strike Command.

CRW'10

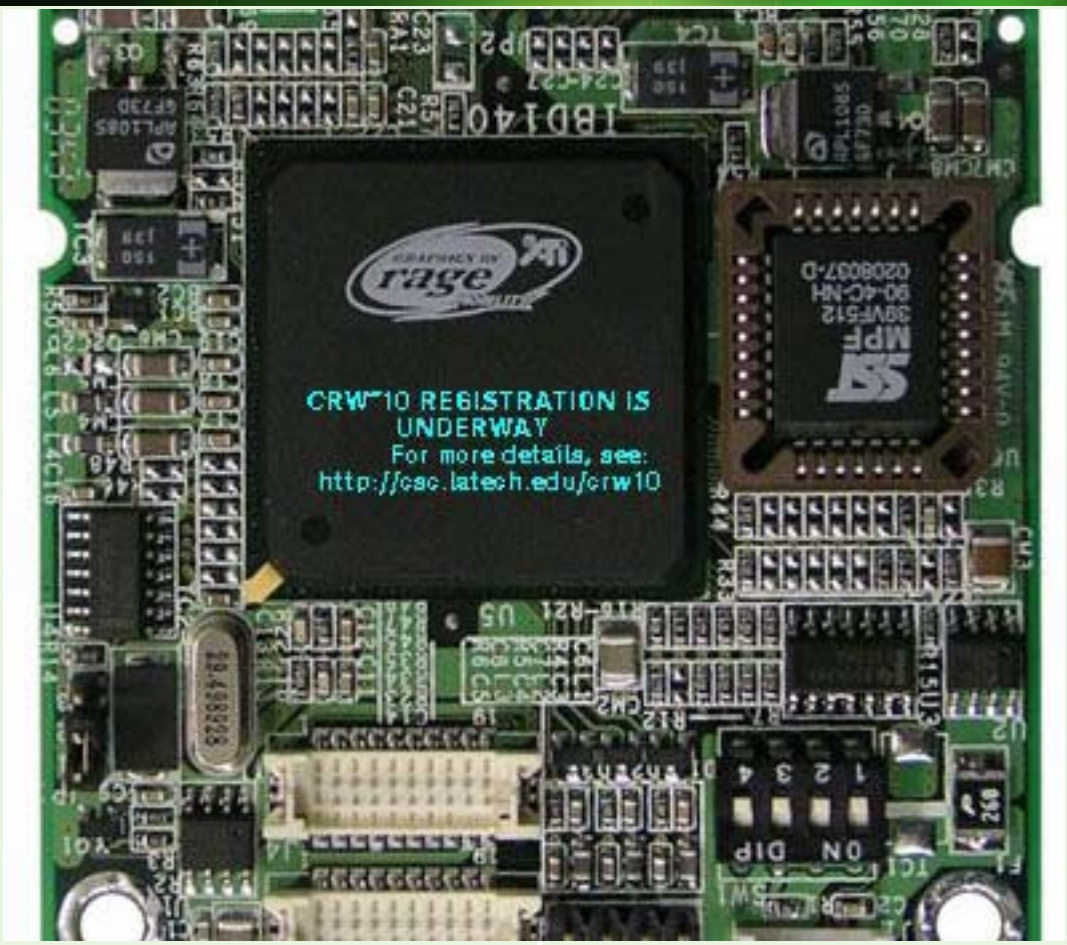
This year, the theme for the 3rd Cyberspace Research Workshop held in conjunction with the Air Force Global Strike Command, the Cyber Innovation Center, and the Center for Secure Cyberspace at Louisiana Tech University, centers on security in a cyber-centric world, where cohabitation with malware is presumptive.

Cyberspace is increasingly becoming more mainstream, and an active part of our lives. It is fraught with risk, particularly due to the explosion of malware and other malicious entities. While much research attempts to address security within cyberspace, it is incumbent upon us to also consider an environment where people and malware cohabit.

The purpose of CRW'10 is to engage in discussions that address cyber security in such an environment by analyzing problems and finding solutions in a wide range of relevant areas.

Topics (including but not limited to):
*Strategic Cyber Defense
*Global Cyber Situational Understanding
*Malware & Anti-Malware Technologies
*Coping with Malware
*Information Security & Assurance
Information Warfare
*Cyberspace & the Human Element

CRW'10 REGISTRATION



Registration for the 3rd Cyberspace Research Workshop is underway. This event will be held on November 15, 2010 in conjunction with the Air Force Global Strike Command Technology and Innovation Symposium at the Shreveport Convention Center in Bossier City-Shreveport, LA.

The workshop will provide a venue to discuss emerging technologies, share ideas and create opportunities for researchers and practitioners in various areas of cyber security.

All participants are invited to submit full papers of five-ten pages, and extended abstracts four pages, by September 1, 2010. Registration and full submission instructions are located at: http://csc.latech.edu/crw10.

This year, submissions will be made through EasyChair. Our conference is located at: http://www.easychair.org/conferences/?conf=crw10. More information about the AFGSC Technology and Innovation Symposium can be found at: http://www.cyberinnovationcenter.org/symposium.

SUMMER AND THE CENTER

Ph.D. Student
Jun Dong Chen

Student Summer Research:

This summer I have been working on task allocation in mulitiple autonomous agent systems via game theoretic approach, by endowing the agent the capability of autonomy, the whole system is decentralized. The decentralized system had the advantages of fault-tolerance and computational distribution. In order to decrease the communication cost of the whole system, we restrict the agent to communicate within a limited range. Under this restriction, the agents have incomplete information. I propose to use learning automata to solve the limited communcation range restriction. A learning automata is an adaptive decision making device through interaction with a stochastic environment. I want to find whether there is an equilibrium state, in which each agent can optimize its utility, and the whole system can work on an optimal state.

Ph.D. Student
David Irakiza

Student Summer Research:

This summer I have been working with Dr. Joseph Kizza from the University of Tennessee at Chattanooga. Dr. Kizza has enlisted my help in dealing with Trust Propogation in Airborne Networks. My work has involved studying and understanding these networks, and the concept of zero knowledge protocols, as they are essential in these type of networks where authentication has to be done without identification of entities in the network.

More specifically, we have tried to modify the code that had been developed earlier to handle the authentication process (this is still ongoing). We have also come up with some mathematical models of trust propagation thorugh the network when the incoming entity has been authenticated. Finally, we are looking at finding a suitable and plausible stopping condition for the trust propagation given that time and size of the network are limiting factors to this propagation.

Personally, working with Dr. Kizza during this time has been a great learning experience given his vast experience and knowledge in the field of Cyber Security.

SUMMER AND THE CENTER

CSC Computer Science Undergraduate Student Stephan White

Student Summer Research:

This summer I have been working with Dr. Joseph Kizza from the University of Tennessee at Chattanooga. We have had to create a protocol, which is extremely secure, but fast enough for a passing plane to be able to finish it before it is out of a network range.

My work with the project has been focused mostly with the propogation of trust throughout the network. In the time I have been lucky to have with Dr. Kizza, I have developed a propogation model, which so far meets our needs. I based it off of social patterns of which I gained insight from another student, Abena Primo.

I have also been working with David Irakiza, a Ph.D. student at Louisiana Tech University. We have been working to modify and/or develop a working client-server program to test the authentication and trust propogation processes in various network configurations.

This has been an eye-opening experience for me. I am very excited to have had the opportunity to work on real-world problems while still an undergraduate. I've thoroughly enjoyed every minute of it.

Ph.D. Student Abena Primo

Student Summer Research:

This summer I have been working with Dr. Joseph Kizza from the University of Tennessee at Chattanooga.

My work with Dr. Kizza involved the proposed use of a revised Feige-Fiat-Shamir ZKP Scheme for use in airborne networks. In trials, this scheme has shown success, as well was when applied to a prover and a verifier.

Over the summer, we explored how trust could be built and propagated in a network with multiple verifiers. We also explored stopping conditions for trust propagation in airborne networks. Moreover, we also explored authenticating a node reentering an airborne network. Future work in this area includes modifying Dr. Kizza's Feige-Fiat-Shamir ZKP Scheme, and testing our conjectures with sensors.

SUMMER AND THE CENTER

Ph.D. Student
Justin Rice

Student Summer Research:

This summer I have been working at NASA working in various areas of research. Some of those areas include literature reveiwed topics such as: the advantages/disadvantages of distributed AI agent architectures, i.e. first order logic, reactive, belief-desire-intentions; commonly used task distribution mechanisms, i.e. market mechanism, contract net, and multiagent planning; and agent interaction protocols, i.e., coordination, cooperation, and negotiation.

Ph. D. Student
Abdul Serwadda

Student Summer Research:

This summer I have been working on the security of size-based scheduling schemes in the Internet. Right from the first studies carried out in the 1990s, several Internet traffic measurements have shown that flow size distributions often exhibit high variability. The vast majority of Internet flows are short, while a very small percentage of the largest flows constitute the majority of the total load. To exploit this property for performance improvement in routers and Web servers, several studies have proposed size-based scheduling mechanisms to offer preferential treatment to the shortest flows. However, little has been done on the security of these schemes. In our current work, we adopted a combination of analytical and experimental techniques to propose security mechanisms for SBS schemes in the Internet. I am continuing to work in this area.

THE WELCOME MAT

The Welcome Mat was out for Dr. Joseph Kizza for June 1, through June 30, 2010. Dr. Kizza was kind enough to share his expertise with faculty, staff and students for the month. Thank your Dr. Kizza for you devotion to the discipline.

On June 1, 2010, the Center for Secure Cyberspace welcomed Dr. Joseph Kizza from the University of Tennessee at Chattanooga. Dr. Kizza received his Bachelor's of Science in Mathematics and Computer Science in 1975 from Makerere University in Kampala, Uganda, and a Master's in Science in Computer Science in 1980 from California State University, a Master's in Arts in Mathematics from University of Toledo, Ohio in 1985, and a PhD in Computer Science in 1989 from the University of Nebraska-Lincoln, Nebraska.

Dr. Kizza has been with the department of Computer Science at the University of Tennessee at Chattanooga, Tennessee since 1989, where he is teaching, and performing research in the areas of Social Computing, Operating Systems, Computer Network Security, and Computer Forensics.

Dr. Kizza has organized a number of workshops and conferences on Computer Ethics, producing proceedings, and has published several books on computer ethics and network security and cyberethics. He was appointed a UNESCO expert in Information Technology in 1994.

Dr. Kizza spent a month at Louisiana Tech Univerisity working with students on Zero Knowledge Protocol (ZKP) Authetication in Airborne Networks (ANs). Dr. Kizza used two parallel processes: 1) to update and develop new ZPK code for an AN constallation/cluster authentication of a node seeking entry into that constallation/cluster, and 2) to develop mathematical models for "Trust Propogation in Airborne Networks."

Dr. Kizza and students David Irakiza, Abena Primo, and Stephan White have made some progress in the time he has been at Louisiana Tech University. Dr. Kizza views the students as wonderful, extremely engaging, and expansive in the their works together.

The students feel they have gained experience and knowledge working with Dr. Kizza in such a manner. They are greatly appreciative of the time he spent with them.

Center For Secure Cyberspace

Dear Subscriber,

The Summer 2010 edition of the Louisiana Tech University's Center for Secure Cyberspace Newsletter, as well as previous editions of this Newsletter can be viewed on the website under the News&Events section.

You may access the website by entering http://www.csc.latech.edu in your browser address.

Thank you for your continued support.
-The Center for Secure Cyberspace at Louisiana Tech University

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