Global Communications Newsletter

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Student Paper Contest on Information Security SIBINFO

By Oleg Stoukatch, Alexander Shelupanov, and Evgeniy Golovin
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It is well known that a priority for ComSoc is to increase the activity in Chapters and student branches, and to support initiative projects. One of the projects of the Tomsk Chapter is the annual All-Russia Student Paper Contest on Information Security (SIBINFO), based on IEEE rules, which was successfully held for the third time in April 2003. In connection with the establishment of the Siberian IEEE Section in February 2003, this contest was the first event in the Section with technical support from ComSoc. The suggestion to start the contest came from the Tomsk Chapter Chair, who motivated Tomsk State University of Control Systems and Radioelectronics (TUSUR) to start this crusade.

The contest was organized by the Department of Complex Information Security of Computer Systems (KIBEVS TUSUR), the leading department in Siberia for the education of engineering students in the field of information security. The organization was supported by the Tomsk IEEE Chapter and Student Branch (http://me.tusur.ru/~tieee), the GOLD Affinity Group of the Siberia Section, and co-sponsored by the IEEE Communications Society (ComSoc) and the IEEE Foundation (project 2001-051). It should be noted that the contest was carried out successfully in many respects due to ComSoc's sponsorship.

No other Region 8 Chapter has carried out a similar contest. The two phases of the contest — paper and oral finale — attracted many Russian participants who discovered for themselves ComSoc and its benefits. The Student R&D Divisions in the Russian universities hold contests in training courses, but not at an international level.

Preparation of the Student Paper Contest started one year ago. The organizing committee sent more than 200 information letters to universities. Information about the contest was published on the Web site. More than 50 papers from 11 universities were accepted during the first stage of the contest. The commission of experts had to work for a month to review them all.

The examination of papers was anonymous, and the experts evaluated them on the following criteria: independence, essence of the technical contents, scientific novelty, informativeness and accuracy of the abstract, comprehensiveness of the conclusions, ordering and literacy of the text, ingenuity and resourcefulness in methods of presentation, choice of illustrations, use of analogies, and the like. In the end, the best 15 papers were selected for the oral finale.

The finalists were informed, and all of them came to Tomsk. We are not aware of such a representative delegation getting together before. Practically all participants came by train, making very long trips. Also, many specialists of leading Tomsk organizations, students, and post-graduate students attended the contest.

On the morning of April 23, Professor A. A. Shelupanov, head of KIBEVS, opened the oral presentation in the conference hall of TUSUR. He told about the Department and Center of Information Security. After that, the participants of the contest presented their papers. Once again, a representative jury of respected professors evaluated the participants' performances.

Many interesting papers were presented during the contest: "Modern Methods of Building Digital Wwatermarks," on the use of watermarks for multimedia authentication and the problem of watermark stability against wipe attempts; "User Identification on Keyboard Marked Biometric Parameters, Using Artificial Neural Networks," about user recognition and identification by typing behavior; "Studying Safety Incidents, Using a Network System for Attack Detection," devoted to analytic methods of detection of system intrusions; "Enhancing Digital Signature Calculation Using a Dedicated Scheme," on a new algorithm of crypto transformation and compression; "Signal-Coding Model for the Insertion of Information in Sound for Hidden Data Transfer through the Sound Channel," with a practical demonstration; among others.

The participants did a lot of work on their computer presentations with amazing software demonstrations. Sometimes the participants were so involved in discussion that they forgot about time. All papers were accompanied by elaborate enthusiastic discussions by the participants, which was difficult to stop. All papers were very interesting for the audience.

After the presentations, some brief information about IEEE membership benefits was presented by the IEEE Chairman, while the jury decided the winners of the contest. All finalists of the contest were handed certificates and souvenirs. The winners were awarded prizes, diplomas, and valuable gifts.

After the oral presentations and awards ceremony, an excursion to the famous Tomsk attractions and neighborhoods was arranged for the contest participants. A professional guide told all about one of the oldest cities in Siberia. The guests enjoyed the wooden architecture of the city very much. Tomsk was founded in 1604, and its historical city is 400 years old. There are plenty of historical landscapes (Siberian taiga, cedar forests), and cultural and architectural objects to attract the attention of the visitor. It is possible to learn more about Tomsk on the Web at http://eng.tomsk400.ru.

Another interesting result of the contest was the establishment of some close contacts between colleagues working in the field of information security. While getting acquainted

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Asia: Center of the World's Wireless Explosion

Madanmohan Rao reports from the ITU Telecom Asia 2002 summit in Hong Kong

The results are in; and the numbers are impressive. Asia now accounts for 36 percent of the world's telecom market (up from 21 percent in early 1991, and scheduled to hit 50 percent in 2007), the world's largest regional user base of cellphones, 33 percent of the world's Internet user base (225 million Internet users, or an average of 6.3 users per 100 inhabitants), 95 percent of the world's 3G mobile users, 47 percent of the world's asynchronous digital subscriber line (ADSL) broadband Internet users, and seven of the world's top 10 most profitable telecom operators.

According to International Telecommunication Union (ITU) figures of June 2002, the top market worldwide in terms of broadband Internet penetration is South Korea, followed by Hong Kong, Canada, Taiwan, Belgium, Sweden, Ireland, the United States, Denmark, Singapore, Austria, and Japan. At the end of 2001 the market with the highest penetration of cellphones was Taiwan (a whopping 96 percent), followed by Hong Kong (84 percent), Singapore (69 percent), New Zealand (62 percent), South Korea (60 percent), Australia (57 percent), and Japan (57 percent).

Asia also accounts for four of the top 10 markets in the world in terms of wireless Internet user base as a percentage of mobile users: Japan and South Korea are in the lead, followed by Finland, Canada, Singapore, the United States, Germany, Italy, the United Kingdom, Taiwan, and France.

Asia is now the largest and most innovative telecom market in the world; but it must demonstrate leadership in this role, said Yoshio Utsumi, secretary general of the ITU, at the recent ITU Telecom Asia 2002 summit in Hong Kong, "From Recovery to Prosperity."

Michael Minges, head of the ITU's data and statistics unit, says the Asia-Pacific region remains the world's largest telecommunications market, posting steady growth in telephone, mobile, and Internet subscribers. "This region continues to push the envelope for universal service," Minges says, noting that the region had been able to add "one new telephone user every second for the past decade."

Growth in Asia-Pacific telephone subscribers was around 10 percentage points above the global average, with the gap increasing over last year. There are more cell phone users than fixed line users in 23 Asian nations including Japan, China, Indonesia, and Fiji.

From 1991 to 2001, China added over 300 million new telephone subscribers, half of the regional total, taking its combined teledensity from less than one in 1991 to 30 by mid-June 2002. "Never before has a country added so many telephone subscribers so quickly and raised its teledensity so rapidly," says Minges.

Challenges remain, of course, for many operators in terms of figuring out how to migrate to 2.5G or 3G for competitive reasons without losing out on fully recovering costs of GSM networks that have already been rolled out. The entry of new wireless players in some Asian markets has not been a smooth process either, and other markets like China are slowing down.

Confusion is also growing as companies like Nokia announce new 3G standards. Uncertainty in liberalization rules has discouraged international carriers from investing in markets like China. There is also confusion in some markets as to whether WiFi will compete with 3G, when they are actually complementary services.

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"Companies need to figure out how to leverage the wireless explosion for creating new fields of applications, new ways of using applications, and new ways of developing applications," said Naoyuki Akikusa, CEO of Fujitsu.

A mix of content and transactional services has also been beneficial for Korean mobile operator KTF, which has 11 million users today (SK Telecom leads with 17 million). KTF rolled out 2.5G services in 2001, and MMS in May this year. More foreign investment is also coming into the Korean wireless sector, such as from Microsoft and Qualcomm. In Australia, Telstra and nineMSN have teamed up to bring Hotmail and Instant Messenger to mobile users.

"The most popular services on our 2.5G network are Internet, adult TV, games, video on demand, and karaoke," said Joo Young Song, executive vice president at KTF. As a percentage of total ARPU, data services accounted for 10 percent in October 2002, up from 5 percent in January 2001. This could cross 15 percent in 2003 and 30 percent in 2005, Song predicted, as the market for voice gets saturated.

"Content-centric value chain coordination has been key to our success," said Takeshi Natsuno, managing director of I-Mode strategy for NTT DoCoMo; I-Mode has 35 million users since its launch less than four years ago. Similar content-centric models accounted for the success of AOL in the United States and Minitel in France.

"Coordination of these layers involving devices, network, server, marketing, and user needs should be seamless and continuously evolving. We were advised by consultancies like McKinsey to take as much money as possible from content providers; but we did not listen to them, fortunately," said Natsuno. I-Mode takes only 9 percent commission from its content providers.

Carriers should also keep an eye on newer devices created by the IT industry, such as PDAs and PCs with GSM and 3G chipsets fully integrated. "Completely new devices will emerge in five years. Handsets will be as powerful as today's laptops," said Bosco Fernandes, vice president at Siemens Information and Communication Mobile Networks.

Currently, however, NTT DoCoMo has no plans for I-Mode on other handheld devices like PDAs. User growth of the 3G FOMA service has been slow because of fewer devices in the market and smaller coverage area, said Natsuno.

i-Mode has not taken off yet in Europe, and many European operators prefer to build on existing successes like short message services (SMS) and focus on multimedia message services (MMS) for expansion.

Cell phone subscribers will send about 400 billion text messages globally during 2002, up from 250 billion in 2001, according to the GSM Association.

The Asia-Pacific region will be the world's testbed for 3G services for the rest of the decade, said UMTS Forum chairman Bern Eylert. The region will account for $118 billion of global 3G revenues of $320 billion in 2010; the top three 3G markets in the world will be the United States, China, and Japan.

Interesting cultural differences are also emerging among users across the world. For instance, the craze for wireless content is not as high in Hong Kong as in Japan or South Korea, observed Francis Wong, managing director of Trident in Hong Kong.

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Asia: Center of the World's Wireless Explosion
(cont'd)

The Hong Kong market will experience more growth in applications like email, not entertainment, Wong said. 80 percent of business users in Hong Kong access email on the move. The market already has 84 percent penetration of cell phones, and growth will come not from new users but from new and improved services.

Many carriers are now expanding their focus from basic telecom and wireless services to value-added services, especially for corporate customers. "Carriers are forming partnerships with us for managed network services, virtual private networks (VPNs), and other enterprise applications," said Gordon Astles, president of Asia-Pacific operations for Cisco.

There has been too much focus on the gloom of industry dynamics in markets like the United States, on issues such as governance — but the consumer has never had it so good.

Other mega-projects to keep an eye on include the Digital Beijing project for 2008, during the Olympic Games, which includes city-wide fiber and wireless internetworking called the City Information Infrastructure (CII), information kiosks, and smart cards.

In many developing countries of Asia, the penetration of cell phones has already exceeded the penetration of land lines (Cambodia was the first country in the world to cross this threshold, in 1983). "A whole new development paradigm will be unleashed in the next few years in Asia," said Utsumi.

Telecom players and vendors need to focus on inclusion strategies, not just products, said Noah Samara, CEO of Worldspace; the company beams radio and Internet content via satellite to parts of the world like Asia and Africa, including medical journal archives for healthcare workers. "Content should become a major focus area for telecom players," advised Samara.

Mobile voice alone will account for huge markets in countries like India and Vietnam. By 2005, half of the world's population will be using cellphones.

A lot of data that is critically needed by the masses is in the public domain, and a number of technologies are emerging that can help bridge the critical "last mile" problem for WiFi and satellite.

But regulatory obstacles are holding back services like WiFi and voice over IP (VoIP) in many developing countries of Asia, observed Heather Hudson, telecom professor at San Francisco State University.

Universal access goals are also becoming moving targets, evolving from basic landline connectivity and wireless access to Internet and then broadband. Developing nations should prioritize these services and target user organizations such as healthcare, libraries, NGOs, schools, and governments. Sites like www.UniversalService.org have useful information resources and case studies in this area.

"Technology is moving in the right direction. Human brokers — for instance, for operating telecentres and providing wireless access on a shared basis — are very important in this regard for developing nations," advised Hudson.

Mobile voice alone will account for huge markets in countries like India and Vietnam. By 2005, half of the world's population will be using cell phones, according to Amarendra Narayan, executive director of the Asia-Pacific Telecommunity, in Bangkok.

Madanmohan Rao is the author of The Asia-Pacific Inter-

The Fourth Conference on Telematics Engineering (JITEL 2003)
By Álvaro Suárez and Elsa Macías, Spain

The Fourth Conference on Telematics Engineering took place in Gran Canaria (Canary Islands), Spain, September 15–17, 2003. The previous celebrations of this conference took place in Bilbao (1997), Leganés (Madrid, 1999), and Barcelona (2001). JITEL is the flagship meeting of Spanish researchers and industry experts on the following topics: network design and interconnection, distributed platforms and network management, agents and active networks, access networks, traffic models and control, mobile and wireless communications, network security, multicast, multimedia services, design and implementation of communication protocols, applications (electronic commerce, tele-education, tele-work, tele-medicine, etc.) and social influence of communication technologies, among others.

JITEL 2003 attracted 155 submissions, of which 69 submissions were selected as regular papers and 25 as short papers for presentation at the conference. They were organized in 12 technical sessions for regular papers and four extra sessions for short papers. This year, several researchers from South America participated. This fact is important from our point of view, because it reveals the close collaborations among Spanish researchers and South-American ones to the present. Details on the technical program are available at http://www.jitel.org. The best paper award went to "Analysis and Design of Admission Control Methods in Multiservice Cellular Networks" by Vicent Plà Bosca and Vicente Casares Giner from Technical University of Valencia.

The conference proceedings were published by University of Las Palmas de Gran Canaria Publications Service after formal consideration of the Steering Committee. These proceedings can be obtained from the aforementioned service. The electronic proceedings were provided as a CD-ROM that also served as the identification card of the participants.

On September 14, two interesting tutorials were presented: Professor Vaidy Sunderam from Emory University (Atlanta, Georgia) presented the current problems of design of applications for wireless local area networks. Ana Gómez (Technical University of Madrid) and Iñaki Goirizelaya (Basque University, Spain) presented problems and solutions for electronic voting in our time. The keynote lecture by Lidia Fuentes (Malaga University) was about software aspects of implementing telematics applications. Professor Manuel González (University of Las Palmas de Gran Canaria) presented the "European Space of Higher Education," deeply discussed by the experts panel on September 15 and also considered by the industry experts panel on September 16.

We hope that JITEL 2003 will be remembered as a good technical meeting and a pleasant occasion to meet friends and colleagues, and thus contribute to the success of the future editions of JITEL.

8th IEEE Symposium on Computers and Communications (ISCC'03)

By Yurdaer Doganata, ISCC '03 Technical Program Co-chair

The Eighth IEEE Symposium on Computers and Communications (ISCC 2003) was held in Antalya, Turkey, 31 June–4 July, 2003. ISCC started in 1995 in response to the growing interaction between the fields of computers and communications. ISCC takes place annually at the beginning of July. Previous symposium locations have included Egypt, Greece, France, Tunis, Italy, and Turkey, with plans for other sites in the Mediterranean region. The ISCC has grown in strength and quality over the past eight years into an international forum where issues in many areas of computers and communications are addressed and discussed.

This year the number of submissions was double that of last year, in spite of the Iraqi War, SARS thread, and worldwide worsening economical situation. A record number of papers were submitted: 455, received from 40 countries. Twenty technical sessions in four tracks were organized to present accepted papers. The conference program focused on all aspects of computers, communications, and service provisioning over enhanced global telecommunications networks. The four days of the conference covered comprehensive topics in research and applications. This year's program consisted of sessions on Network Reliability and Quality of Service; Wireless, Cellular and Mobile Communications; Mobile Ad Hoc Networks; Distributed Systems, Control and Optimization of Communication Systems; Security, Privacy and Information Access, Signal Processing in Communication Networks, High Performance Networking and Protocols; Web-Based Systems and Network Management; Electronic Commerce; Internet Services and Applications; Management of Information Technology; Programmable and Active Networks; Multimedia Information Management and Exchange; Network Design, Operation, and Management; and Data Mining and Knowledge Discovery and Applications. The program details can be found at the Web site, http://www.comsoc.org/iscc/2003/.

In addition to the technical program, two tutorials were held. The first, "Anytime, Anyplace, Anyhow Multimedia Wireless Access: The Vision of Mobile Ad Hoc Networking," was offered by Prof. George N. Angelo of the Institute of Technology, Athens, Greece; the second one, "Broadband Network and Service Management: From Concept to Products," was offered by Joseph Ghetie of Telcordia Technologies, USA.

Participants received a broad perspective through the keynote speeches delivered by six distinguished speakers: Prof. Claus Weyrich, Member of the Managing Board of Siemens AG, Head of Corporate Technology in Munich, Germany; Prof. Kemal Inan, Dean of Faculty of Engineering and Natural Sciences, Sabanci University, Istanbul; Faruk Eczacibasi, Vice President of Eczacibasi Holding, President of Eczacibasi Information Technologies Inc., Turkey; Prof. Sartaj Sahni, Chair, CISE, University of Florida, USA, Giuliano Di Vitantonio, HP Labs Palo Alto, USA; Prof. Jean-Jacques Quisquater, Université Catholique du Louvain, Belgium.

The panel organized by Prof. Mehmet Ulema brought together many experts in the field of wireless networks who discussed various exciting aspects of next-generation wireless networks and services.

The Best Paper award went to Moufida Maimour and Cong Duc Pham for their paper, "AMCA Active Based Multicast Congestion Avoidance Algorithm." The Best Student Paper Award went to Mustafa Ergen, Duke Lee, Raja Sengupta, and Pravin Varaiya for "Wireless Token Ring Protocol — Performance Comparison with IEEE 802.11." There were two awards for Best Local Papers. These awards went to Ozgur Ercetin and Leandros Tassiulas for "Pricing and Peering Strategies of Differentiated Services Content Networks." and M. Pazarci for "Data Embedding in Scrambled Digital Video."

We are indebted to many individuals whose contributions made this conference possible. In particular, general co-chairs Dr. Ahmed Tantawi and Prof. Kemal Inan, technical program co-chair Prof. Phuoc Trangia, local chairs Prof. Ezhan Karasan and Prof. Nail Akar, registration chair Prof. Reda Ammar, tutorial chair Prof. Cem Ersoy, and Web chair Dr. Kurt Tutschku. We are also very grateful to all TPC members, steering committee members, and reviewers for their diligent work under very tight schedules.

We are confident that ISCC will continue to attract many good technical papers and discussions, and foster an excellent environment in which to meet friends and colleagues (more information at http://www.comsoc.org/iscc/2003/).

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STUDENT PAPER CONTEST/*(cont'd from page 1)*

with professionals more involved in business administration than in engineering, we figured out that they were actually becoming very interested in information security questions. Moreover, after the contest we received emails from about 20 people interested in ComSoc activities. We achieved one of the most important duties of a chapter: recruiting new members for our Society.

In summary, we want to thank you, the new IEEE Student Branch members, as well as the management of KIBEVS for your active participation in organizing SIBINFO-2003, and of course all the contest participants. We would like to hear your opinions and comments in order to improve the contest organization.

The contest has become a tradition. The participants have noted a high level of quality, which has improved year by year; it will soon transform into a real international contest. We wish you success and look forward to meeting you at SIBINFO 2004!