

Sabancı
Universitesi

Faculty of Engineering and Natural Sciences
Computer Science and Engineering

Information and Network Security & Privacy Research

Albert Levi
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Computer Science and Engineering
Cryptography and Information Security RG

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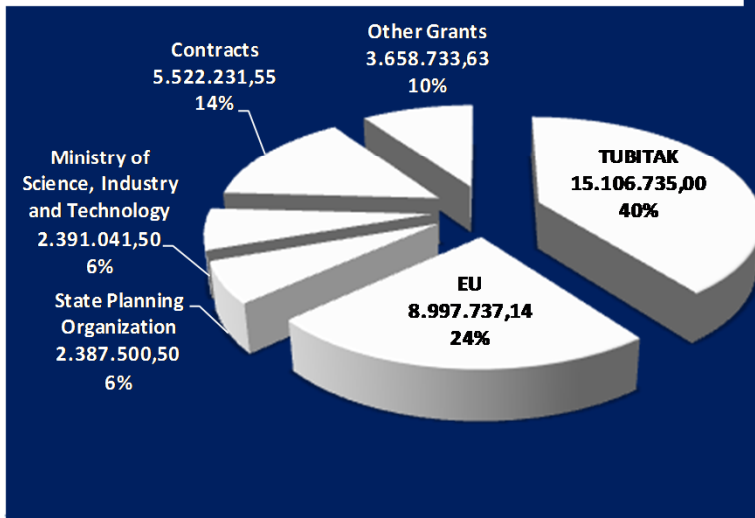
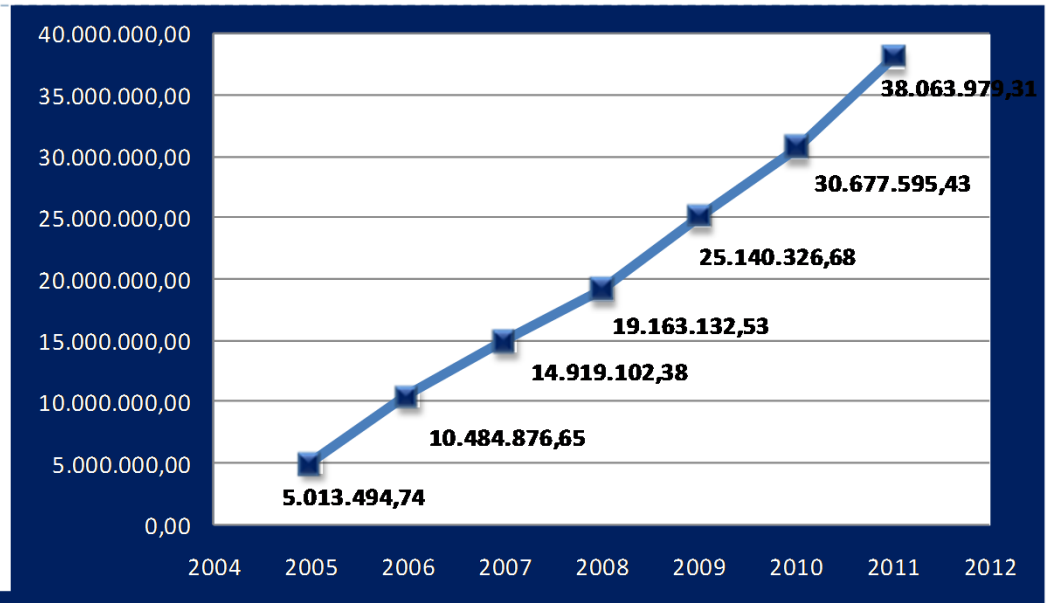
Sabancı University

- ▶ **Founded in 1996**
 - ▶ by Sabancı Group
 - ▶ One of the largest conglomerates of Turkey
 - ▶ Non-profit supported by Sabancı Foundation
- ▶ **Campus University**
 - ▶ Asian side of Istanbul
 - ▶ 1.2 km² (~300 acres)
 - ▶ 182,000 m² (~2M sq. ft.)
- ▶ **~3500 students in three faculties**
 - ▶ ~2850 undergraduate
 - ▶ ~650 graduate



Sabancı University

- ▶ Research University
- ▶ Cumulative Growth of Sponsored Research Funding (2005-2011)
- ▶ Active Research Fund
 - ▶ Total: ~ 19 Million Euros
 - ▶ Per faculty member: 110K Euros



- ▶ 2010 TUBITAK Grants
 - ▶ Ranked 1st among Turkish univ. in the category of per faculty member funding
- ▶ EU FP 7 (2007 – 2010)
 - ▶ 6.4 M Euros
 - ▶ 15% of all Turkish universities

Computer Science and Engineering

- ▶ **Faculty:**

- ▶ 9 full-time faculty members
- ▶ 1 joint appointment instructor

- ▶ **Graduate students**

- ▶ 35 M.Sc. – approx. 10 - 15 new every year
- ▶ 33 Ph.D. – approx. 5 - 7 new every year

- ▶ **Undergraduate students**

- ▶ ~ 90 Juniors/Seniors

Security and Privacy Research @ SU

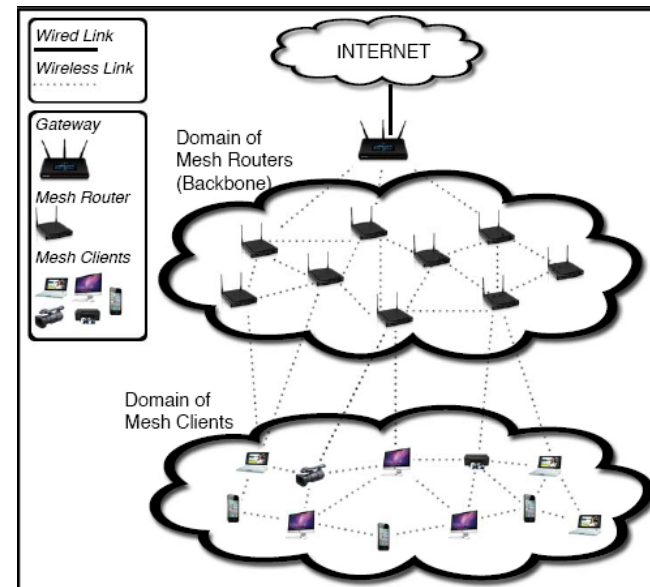
- ▶ **Faculty**
 - ▶ Albert Levi
 - ▶ Erkay Savaş
- ▶ **In collaboration with other SU faculty members**
 - ▶ Yücel Saygın and Berrin Yanıkoğlu (CS)
 - ▶ Özgür Erçetin and Özgür Gürbüz (EE)
- ▶ **Funded by**
 - ▶ TÜBİTAK
 - ▶ EU FP7
 - ▶ Türk Telekom
- ▶ **Students**
 - ▶ 15 grad students
 - ▶ Promoting undergrad research

Albert Levi

- ▶ Ph.D. in Computer Engineering, Boğaziçi University (1999)
- ▶ EXPERIENCE
 - ▶ Boğaziçi University, Research Asst. and Instructor, 1991 - 1999
 - ▶ Oregon State University (USA), Visiting Faculty, 1999 - 2001
- ▶ RESEARCH AREAS
 - ▶ Security in various wireless networking systems
 - ▶ wireless mesh networks (WSNs), sensor networks, RFID systems, ad hoc networks, Bluetooth, cellular networks)
 - ▶ Privacy preserving computing
 - ▶ Privacy preserving IDS log sharing
 - ▶ Privacy preserving data management (collaborations with E. Savaş and Y. Saygın)
 - ▶ Privacy preserving data collection in WSNs
 - ▶ Collusion resistant pseudonym generation
 - ▶ Application layer security issues
 - ▶ Web security, E-mail security
 - ▶ E-commerce and e-payment security
 - ▶ Public Key Infrastructures
 - ▶ Authentication and password management

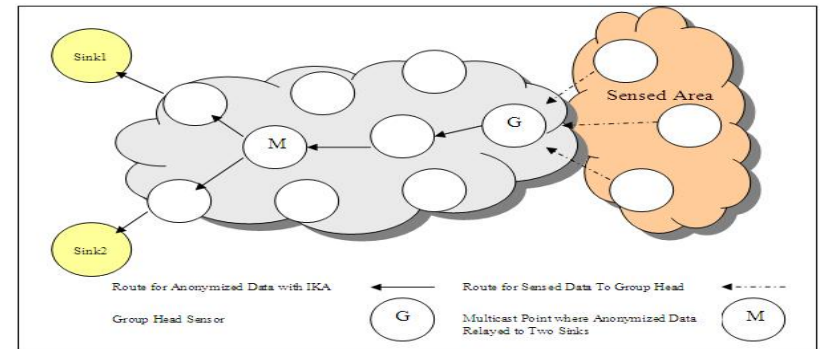
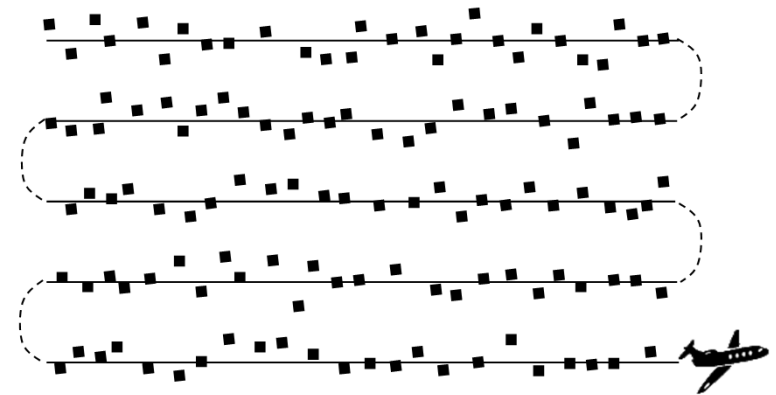
Security in Wireless Mesh Networks

- ▶ WMN
 - ▶ Multi-hop wireless networking technology to provide broadband ubiquitous access in metropolitan area.
 - ▶ We worked in two avenues for WMN security
 - ▶ Distributed key establishment
 - ▶ **Fair billing architecture**
 - ▶ Latter is a sponsored project
 - ▶ SSPayWMN: Secure and Seamless Payment for Wireless Mesh Networks
 - ▶ A secure prepaid payment scheme for broadband Internet access will be designed and developed in a simulation environment
 - ▶ Sponsored by Türk Telekom (2011 – 2013)



Security in Wireless Sensor Networks

- ▶ Main research interest in the last years
- ▶ Categories of research
 - ▶ Spam Attack Prevention in WSNs
 - ▶ Secure Routing
 - ▶ Privacy Preserving Data Collection
 - ▶ Key Distribution in WSN
 - ▶ Mobile WSN Security
- ▶ Projects
 - ▶ TÜBİTAK Kariyer project - finished in 2010
key distribution issues
 - ▶ Another TÜBİTAK project
2011 - 2013
focus in security in "mobile" sensor networks.



Other Security/Privacy Related Research

- ▶ Privacy Related Research
 - ▶ Developed a privacy preserving clustering methodology and applied to different areas such as WSN data collection and IDS log sharing among rivals
 - ▶ Collusion resistant pseudonym providing system
 - ▶ Uses trusted third parties but their partial collusion does not reveal the identities of the users
- ▶ Currently 8 graduate students

Erkay Savaş



- ▶ Ph.D. in Electrical and Computer Engineering, Oregon State University (2000)
- ▶ **EXPERIENCE**
 - ▶ TÜBİTAK UEKAE, Senior Researcher, 1993-1997
 - ▶ Oregon State University(USA), Research Assistant, 1997-2000
 - ▶ rTrust (ICESoft) Technologies(USA), Development Manager 2000-2002
- ▶ **RESEARCH AREAS**
 - ▶ Cryptography and Data Security
 - ▶ Privacy
 - ▶ Privacy in Data Mining
 - ▶ Networked Embedded Systems Security
 - ▶ Computer Architectures & Arithmetic
 - ▶ High Performance Computing
 - ▶ Distributed Systems & Security
- ▶ Currently 6 graduate students

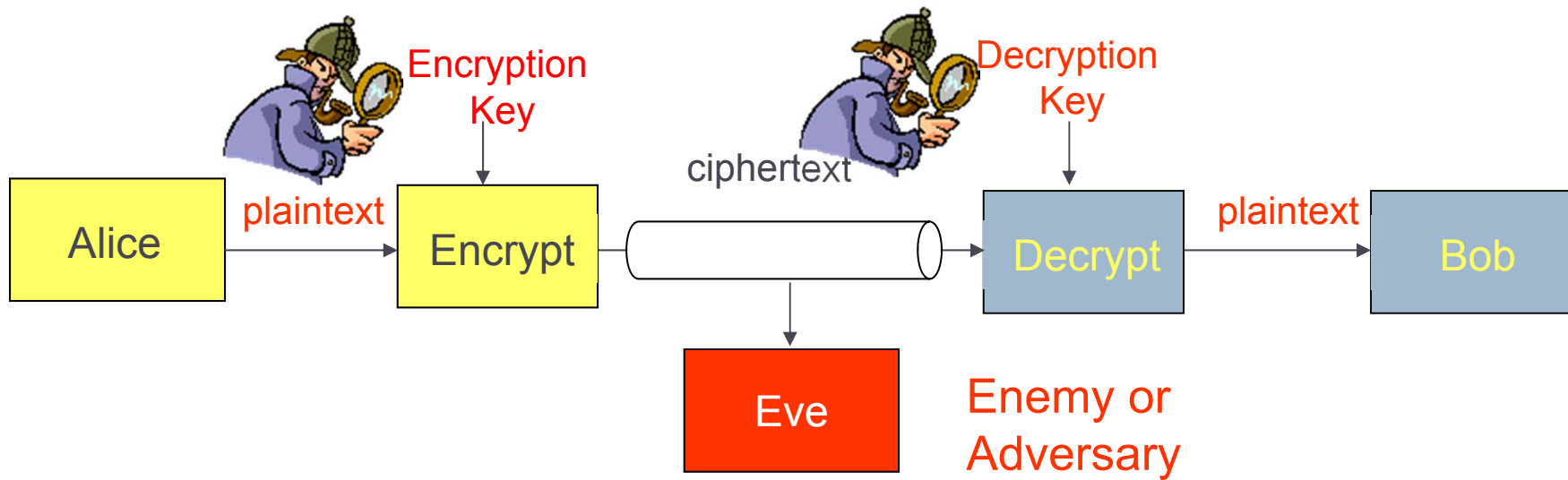


Research Projects

- ▶ **Using Hardware Performance Counters for Software Security Testing**

- ▶ Funded by TÜBİTAK
- ▶ 2011-2013

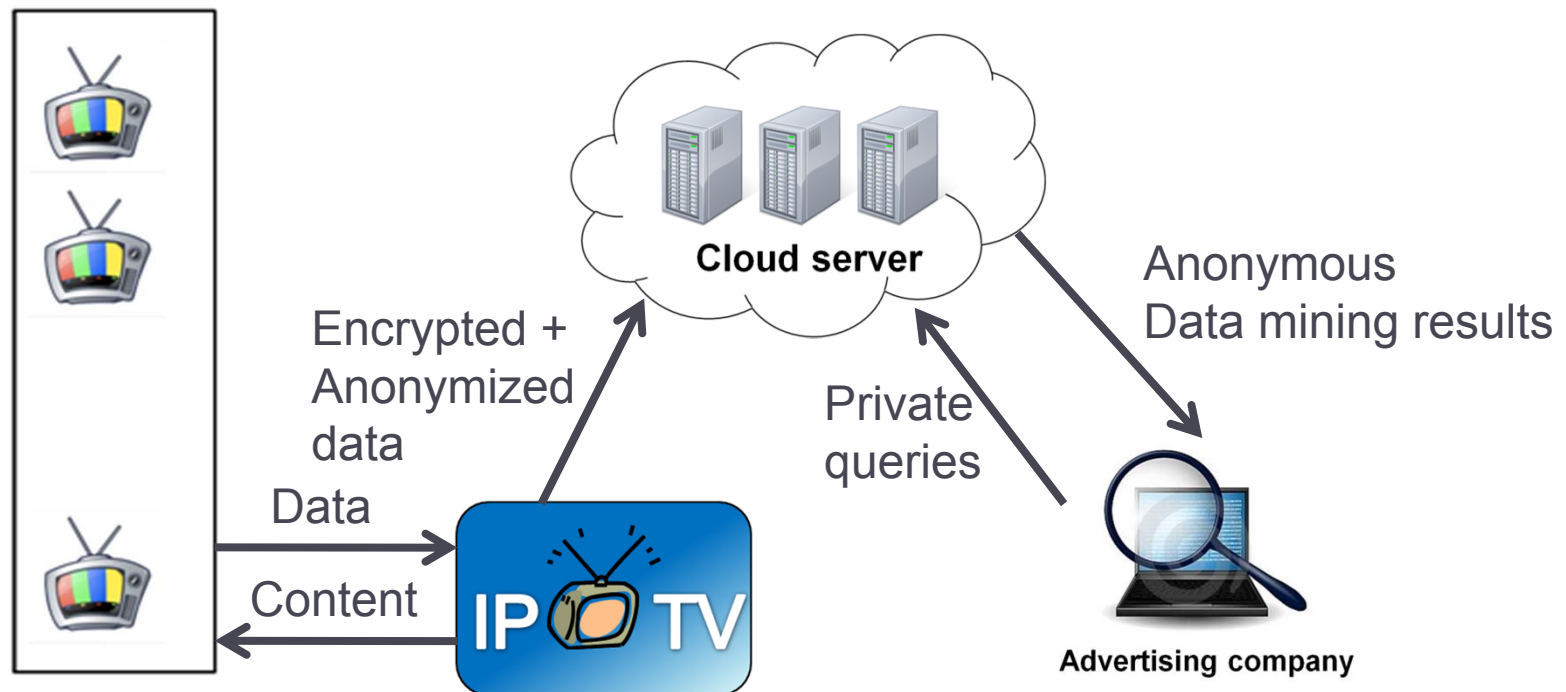
Aim is to find the vulnerabilities in software implementations of security/cryptography applications against side-channel attacks



Research Projects

- **A Practical Private Information Retrieval Scheme for Directed Advertising Services**
 - Funded by Türk Telekom (2011-2013)

Subscribers



Yücel Saygın



- ▶ Ph.D. in Computer Science, Bilkent University (2001)
- ▶ EXPERIENCE
 - ▶ Purdue University (USA), Visiting Scholar, 1999-2000
 - ▶ University of New South Wales, Visiting Scholar, 2002
- ▶ RESEARCH AREAS
 - ▶ Databases
 - ▶ Data Mining and Data Warehousing
 - ▶ Privacy Preserving Data Management



Research Projects

- ▶ **Anonymization of Spatio-temporal Data Sets**

- ▶ TUBITAK Career Grant, 2007-2010

- ▶ **Anonymization of Patient Health Records**

- ▶ Collaboration proj. with Vanderbilt Univ. Medical Informatics Inst.

- ▶ **Geographic Privacy-aware Knowledge Discovery and Delivery**

- ▶ EU IST-FET 6th framework Project, 2006-2008

- ▶ **Knowledge Discovery in Ubiquitous Environments**

- ▶ EU IST-FET 6th Framework, 2006-2008

- ▶ **Web Users Clustering for introducing Personalization in Commercial Web Sites**

- ▶ Funded by TUBITAK and GSRT, 2006-2008

- ▶ **Confidentiality of Data Against Data Mining Methods**

- ▶ EU IST-FET 5th framework Project – approved for 100K Euro, 30K Euro for Sabanci University



Berrin Yanıkoğlu



- ▶ Ph.D. in Computer Science, Dartmouth College, USA (1993)

- ▶ EXPERIENCE
 - ▶ Rockefeller University (USA), 1993-1994
 - ▶ Xerox Imaging Systems (USA), 1994-1996
 - ▶ IBM Almaden Research Center (USA), 1996-1998
 - ▶ IoFlex Inc. (USA), 1999-2000
 - ▶ Michigan State University (USA), 2008 (sabbatical)

- ▶ RESEARCH AREAS
 - ▶ Machine Learning; Computer Vision and Pattern Recognition
 - ▶ **Document Recognition:** handwriting recognition, document retrieval, sketch recognition
 - ▶ **Biometrics:** fingerprint, signature, face, voice modalities; biometric template protection
 - ▶ **Machine Learning:** classifier combination schemes
 - ▶ **Image Retrieval:** image identification and retrieval for plant images



Research Projects – Biometrics

Developed systems for biometric authentication using fingerprint, signature, face and voice modalities; suggested models for biometric template protection and biometric privacy

- ▶ **TÜBİTAK Project (No: 105E165 Duration: 6/2006-1/2008)**
“Privacy Protecting Biometric Authentication Systems”

