Curriculum Vitæ

Personal

Name: Mohamed Kaâniche

Date, Place of Birth: December 15, 1963, Tunisia

Nationality: French

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Current Position

Directeur de Recherche at LAAS-CNRS, Toulouse, France

Head of the Dependable Computing and Fault Tolerance Research Group (http://www.laas.fr/TSF)

Education and Qualifications

- Feb. 1999: "Habilitation à Diriger les Recherches", INP, Toulouse
- Jan. 1992: PhD in Computer Science, INP, Toulouse
- Sep. 1988: Certificate of Higher Studies, Université Paul Sabatier, Toulouse
- Jul. 1987: Certified Engineer Degree, National School of Civil Aviation, Toulouse

Appointments

- Oct. 2008 to Present: "Directeur de Recherche", LAAS-CNRS, Toulouse
- Oct. 1995 – Sept. 2008: "Chargé de Recherche, 1ère Classe", LAAS-CNRS, Toulouse
- Mar. 1997 – Feb. 1998: Research Assistant Professor, University of Illinois at Urbana-Champaign IL, USA
- Oct. 1991 – Sep. 1995: "Chargé de Recherche, 2ème Classe", LAAS-CNRS, Toulouse.

Research Interests

Dependable and Secure Computing: Analysis, Assessment and Protection

- Resilience and dependability evaluation using stochastic models and experimental measurements
- Anomaly and intrusion detection based on machine learning and AI techniques
- Vulnerability analysis and computer systems security assessment:
- Applications: critical infrastructures and cyberphysical systems (avionic, automotive, energy), Cloud, IoT

Publications

- 162 papers in scientific journals and conference proceedings, 2 co-authored books and 1 patent

Supervised Theses

- 22 PhDs (9 as main advisor)

Teaching

- 50 hours per year on dependability concepts and assessment techniques in engineering schools (ENAC, ENSAE, INSA, ENSEEIHT, etc.) and universities (Université Paul Sabatier, Université de Montpellier)

European and National Research Projects

- Participation to 32 collaborative research projects (Europe (12), France (20, including 7 CIFRE)
- I have been the Principal Investigator for LAAS-CNRS for two IST European projects:
  - CRUTIAL "*CRitical UTility InfrastructurAL resilience*", IST-FP6-STREP-27513 (2006-2009)
  - HIDENETS "HIghly *DEpendable IP-based NETworks and Services*" IST-FP6-26979 (2006-2009)
- I have contributed to several cooperative research projects and two networks of excellence funded by the European Commission, including:
  - ReSIST "*Resilience for Survivability in IST*", IST-FP6-NoE-26764, (2006-2009)

- ASSERT "Automated proof-based System and Software Engineering for Real-Time applications", IST-2001-37553 (2004-2006)
- DSoS "*Dependable Systems of Systems*", IST-1999-11585, (2000-2003)
- DeVa "*Design for Validation*", ESPRIT-III-20072, (1995-1998)
- SQUALE "Security, Safety, and Quality Evaluation for Dependable Systems", ACTS AC097, (1996-1998)
- PDCS "Predictably Dependable Computing Systems", ESPRITII-3092, (1989-1992)

• Principal Investigator for LAAS-CNRS for several national cooperative projects including:
- SVC "Secured Virtual Clouds", PAI Project on Cloud Computing (2013-2015)
- DALI "Design and Assessment of Application Level Intrusion detection systems", ANR project – Programme ARPEGE (2009-2011)
- CADHO "Collection and analysis Attack Data based on HOneypots" (2004-2007)

• Participation to 2 industry-Academia common research labs: LIS (Laboratoire d'ingénierie de la sûreté de fonctionnement (1992-2000), and RIS (2000-2004) with LAAS, Airbus, Astrium, EDF, Technicatome, Thales

Society activities

• Vice-Chair of IEEE Computer Society Technical Committee on Dependable Computing and Fault Tolerance (TCFT) (2017-2018). I will be the chair of this TCFT and of the steering committee of the IEEE/IFIP flagship conference on Dependable Systems and Networks (DSN) during the period 2019-2020.

• General Co-Chair of DSN-2016 "the 46th *IEEE/IFIP Int. Symposium on Dependable Systems and Networks",* (Toulouse, France, 2016)

• Program Committee Chair (5)
- LADC-2011 "*5th Latin-American Symposium on Dependable Computing*" (Saint-José Dos Campos, Brazil, 2011); DSN-PDS-2010 "*40th IEEE/IFIP Int. Symposium on Dependable Systems and Networks – Performance and Dependability Symposium*" (Chicago, USA, 2010); EDCC-5 "*5th European Dependable Computing Conference*" (Budapest, Hungary, 2005); PRDC-10 "*10th IEEE Int. Symposium Pacific Rim Dependable Computing*" (Tahiti, France, 2004); SAFECOMP 2013

• 110 participations as a Program Committee member of major dependability-related conferences and workshops including DSN, ISSRE, EDCC, SRDS, PRDC, LADC, SAFECOMP, FTCS, ICDCS.

• Conference Steering Committee (3): DSN (since 2011), LADC (since 2012), VeCoS (since 2007)

• IEEE Security & Privacy: Co-Editor of the "It All Depends" Department (since 2011)

• Member of the IFIP WG 10.4 on Dependable Computing and Fault Tolerance

• Evaluation committees and panels:
- CNRS (UMI2958- GeorgiaTech-CNRS, 2017); HCERES (LIFL-LAGIS, Lille, 2013), CPER 2007-2013 PRST MISN (Région Lorraine) (2011-2013); Europe (IST SAFE-PC (2001-2004); regular participation to the evaluation of project proposals submitted in the framework of ECO-SUD, CHIST-ERA, Research Grant Council (Hong-Kong), DFG/NOW (DE, NL), MIUR (Italy), ANR, University of Toulouse.

Publications (2013-2018)

Journals

G. Vache, V. Nicomette, M. Kaâniche
Evaluation quantitative de la sécurité : Approche basée sur les vulnérabilités
Technique et Science Informatique (TSI), Editions Hermes, vol 32, n°1, pp.41-75, 2013.

G. Vache, M. Kaâniche, V. Nicomette
A Vulnerability Life Cycle-Based Security Modeling and Evaluation Approach
The Computer Journal, Oxford University Press, British Computer Society, vol 56, n°4, pp. 422-439, 2013.

K. Tiassou, K. Kanoun, M. Kaâniche, C. Seguin (1), C. Papadopoulos (2)
Aircraft operational reliability—A model-based approach and a case study
Reliability Engineering & System Safety, Elsevier, vol 120, pp.163-176, 2013. Décembre 2013
(1) ONERA, Toulouse, (2) EADS-Airbus, UK.

R. Ludinard (1), E. Totel (1), F. Tronel (1), V. Nicomette, M. Kaaniche, E. Alata, R. Akrout, Y. Bachy
An Invariant-based Approach for Detecting Attacks against Data in Web Applications

International Journal of Secure Software Engineering (IJSSE), IGI-Global, vol 5, Issue 1, pp.19-38, 2014.
(1) SUPELEC, Rennes.

R. Akrout, E. Alata, M. Kaaniche, V. Nicomette
An automated black box approach for web vulnerabilities identification and attack scenario generation
Journal of the Brazilian Computer Society, Vol.20, N°1, pp.1-16, Janvier 2014.

Y. Bachy, V. Nicomette, E. Alata, M. Kaâniche, J-C. Courrège
La sécurité des box ADSL - Analyse de risques et expérimentations
Ingénierie des Systèmes d'Information (ISI), N°6, pp. 63-88, 2014.

K. Tiassou, K. Kanoun, M. Kaâniche, C. Seguin (1), C. Papadopoulos (2)
Fiabilité de mission d'un avion — Evaluation stochastique en opération
Technique et Science Informatique (TSI), Editions Hermes, Vol.33, N°9-10, pp.777-807, 2014
(1) ONERA, Toulouse, (2) EADS-Airbus, UK.

R. Akrout, E. Alata, M. Kaaniche, V. Nicomette, Identification de vulnérabilités web et génération de scénarios d'attaque, Technique et Science Informatique, Vol.33, N°9-10, pp.809-840, 2014

J. Duchêne, C. Le Guernic (1), E. Alata, V. Nicomette, M. Kaâniche
Outils pour la retroconception de protocoles : Analyse et classification
Technique et Science Informatiques (TSI). Ed. Hermès. Vol.35 N° 3/Mai-Juin 2016.
(1) INRIA Rennes, Université de Rennes

I. Studnia, E. Alata, V. Nicomette, M. Kaâniche, Y. Laarouchi (1)
A language-based intrusion detection approach for automotive embedded networks
International Journal on Embedded Systems. Volume 10, Issue1, 2018
https://hal.archives-ouvertes.fr/hal-01419020/
(1) Renault Guyancourt.

J. Duchêne, C. Le Guernic (1), E. Alata, V. Nicomette, M. Kaâniche
State of the art of network protocol reverse engineering tools
Journal of Computer Virology and Hacking Techniques. Vol.14, N°1, pp 53–68. Février 2018.
https://link.springer.com/article/10.1007/s11416-016-0289-8
(1) INRIA Rennes, Université de Rennes

Y. Bachy, V. Nicomette, M. Kaâniche, E. Alata
Smart-TV security: risk analysis and experiments on Smart-TV communication channels.
Journal of Computer Virology and Hacking Techniques, Springer, 2018.
https://doi.org/10.1007/s11416-018-0320-3.
https://hal.archives-ouvertes.fr/hal-01761974

C. Sauvanaud, M. Kaâniche, K. Kanoun, K. Lazri, G. Da Silva Silvestre
Anomaly Detection and Diagnosis for Cloud services: Practical experiments and lessons learned.
Journal of Systems and Software, Elsevier. Vol.139, pp. 84-106, Mai 2018.

Conferences and Workshops

E. Alata, M. Kaâniche, V. Nicomette, R. Akrout
An automated vulnerability-based approach for web applications attack scenarios generation
Latin-American Symposium on Dependable Computing (LADC-2013), Rio de Janeiro (Brésil), 2013, pp. 78-85.

J. Guiochet, Q. A. Do Hoang, M. Kaâniche, D. Powell
Model-based safety analysis of human-robot interactions: The MIRAS walking assistance robot
International Conference on Rehabilitation Robotics (ICORR), Seattle, USA, 7 p., 24-26 Juin 2013.

I.Studnia, V. Nicomette, E. Alata, Y. Deswarte, M. Kaâniche, Y. Laarouchi (1)
A Survey of Security Threats and Protection Mechanisms in Embedded Automotive Networks
2nd Workshop on Open Resilient human-aware Cyber-physical Systems (WORCS-2013), Budapest (Hongrie), 24 Juin 2013.
(1) Renault S.A.S, Guyancourt; France

I. Studnia, V. Nicomette, E. Alata, Y. Deswarte, M. Kaâniche, Y. Laarouchi (1)
Security of embedded automotive networks : state of the art and a research proposal
2nd International Workshop on Critical Automotive applications: Robustness and Safety, co-located with SAFECOMP-2013, 25 Septembre 2013.
(1) Renault S.A.S, Guyancourt, France

T. Probst, E. Alata, M. Kaâniche, V. Nicomette
An Approach for the AUtomated Analysis of Network Access Controls in Cloud Computing Infrastructures
8th International Conference on Network and System Security (NSS 2014), 15-17 Octobre 2014, Xi'an (Chine), Octobre 2014, 14p.

G. Silvestre, C. Sauvanaud, M. Kaâniche, K. Kanoun
An Anomaly Detection Approach for Scale-out Storage Systems
26th International Symposium on Computer Architecture and High Performance Computing (SBAC-PAD 2014), 22-24 Octobre 2014, Paris (France), 2014, 8p.

Y. Bachy, F. Basse, V. Nicomette, E. Alata, M. Kaâniche, J.-C. Courrèges, Pierre Lukjanenko. Smart-TV Security Analysis: practical experiments. 45thAnnual IEEE/IFIP International Conference on Dependable Systems and Networks (DSN-2015), 22-25 Juin 2015, Rio de Janeiro (Brésil), IEEE CS, 8p.

G. Silvestre, C. Sauvanaud, M. Kaâniche, K. Kanoun. Tejo: a supervised anomaly detection scheme for NewSQL databases. 7th International Workshop on Software Engineering for Resilient Systems, 7-8th September 2015, LNCS, Springer, 13p.

T. Probst, E. Alata, M. Kaâniche, V. Nicomette. Automated Evaluation of NIDS in Cloud Computing Virtual Infrastructures. 11th European Dependable Computing Conference (EDCC 2015), 7-11 Septembre 2015, Paris, IEEE CS.

Y. Bachy, V. Nicomette, E. Alata, M. Kaâniche, J.-C. Courrèges. Security of ISP Access Networks: practical experiments. 11th European Dependable Computing Conference (EDCC 2015), 7-11 Septembre 2015, Paris, IEEE CS.

C. Sauvanaud, G. Silvestre, M. Kaâniche, K. Kanoun. Data Stream Clustering for Online Anomaly Detection in Cloud Applications. 11th European Dependable Computing Conference (EDCC 2015), 7-11 Septembre 2015, Paris, IEEE, 12p.

J. Guiochet, Q. A. Do Hoang, M. Kaâniche. A Model for Safety Case Confidence Assessment. 34th International Conference on Computer Safety, Reliability and Security (SAFECOMP 2015), Springer, LNCS, Delft (Pays-Bas), 22-25 Septembre 2015.

I. Studnia, E. Alata, V. Nicomette, M. Kaâniche, Y. Laarouchi. A language-based intrusion detection approach for automotive embedded networks. The 21st IEEE Pacific Rim International Symposium on Dependable Computing (PRDC 2015), Zhangjiajie (Chine), 18-20 Novembre 2015, IEEE CS, 10p. **Best paper award.**

B. Morgan, E. Alata, V. Nicomette, M. Kaâniche, G. Averlant. Design and implementation of a hardware assisted security architecture for software integrity monitoring. The 21st IEEE Pacific Rim International Symposium on Dependable Computing (PRDC 2015), Zhangjiajie (Chine), 18-20 Novembre 2015, IEEE CS, 10p.

C. Sauvanaud, K. Lazri, M. Kaâniche, K. Kanoun. Towards Black-Box Anomaly Detection in Virtual Network Functions. 46th The IEEE/IFIP International Conference on Dependable Systems and Networks (DSN-2016), Industrial Track, Toulouse, France, 28 juin-1er juillet 2016, IEEE CS.

J. Duchêne, C. Le Guernic, E. Alata, V. Nicomette, M. Kaâniche. Protocol reverse engineering: Challenges and obfuscation. The 11th International Conference on Risks and Security of Internet and Systems (CRiSIS 2016), 5-7 septembre 2016, LNCS, Springer.

B. Morgan, E. Alata, V. Nicomette, M. Kaâniche. Bypassing IOMMU protection against IO attacks. Latin-American Symposium on Dependable Computing (LADC-2016), Cali (Colombie), 19-21 octobre 2016, IEEE CS, 8p.

C. Sauvanaud, K. Lazri, M. Kaâniche, K. Kanoun. Anomaly root cause localization in virtual network functions. 27th International Symposium on Software Reliability Engineering (ISSRE-2016), Ottawa, Canada, 23-27 Octobre 2016, IEEE CS, 10p.

G. Averlant, B. Morgan, E. Alata, V. Nicomette, M. Kaâniche
An Abstraction model and a comparative analysis of Intel and ARM hardware isolation mechanisms.
The 22nd IEEE Pacific Rim International Symposium on Dependable Computing (PRDC-2017), Christchurch, Nouvelle Zélande, Cali (Colombie), 22-25 janvier 2017, IEEE CS, 10p.

J. Roux, E. Alata, G. Auriol, V. Nicomette, M. Kaâniche
Toward an Intrusion Detection Approach for IoT based on Radio Communications profiling.
28th International Symposium on Software Reliability Engineering (ISSRE-2017), Toulouse, 23-26 Octobre 2017, IEEE CS, IEEE CS.

J. Duchêne, E. Alata, V. Nicomette, M. Kaâniche, C. Le Guernic
Specification-based protocol obfuscation
48th Annual IEEE/IFIP International Conference on Dependable Systems and Networks (DSN-2018), 25-28 Juin 2018, Luxembourg, IEEE CS, 12p.