

Kenan Kalajdzic

Computer Professional, Researcher, Instructor

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Kenan believes that versatility and adaptability are among the most essential skills of a contemporary computer scientist and professional. He has therefore sought exposure to many different areas of computer science and engineering, which is well reflected in his rich experience. Kenan is proficient in multiple aspects of computer systems and networks, computer security, programming, research in computing, as well as computer education.

Education

- 2013 – present **Vienna University of Technology, Faculty of Informatics.**
2nd year Ph.D. student of Computer Science (GPA/grade 1.0/A, 21 ECTS).
- 2010 **University of Sarajevo, Faculty of Electrical Engineering.**
Mag. in Electrical Engineering, focus Telecommunications (2 years program, GPA 10.0/10.0).
Magister thesis *Development of a Fuzzy Logic Algorithm to Support Intelligent Process Scheduling in the Linux Operating System.*
- 2003 **University of Sarajevo, Faculty of Electrical Engineering.**
Dipl.-Ing. in Electrical Engineering, focus Control Theory (5 years program, GPA 8.33/10.0).
Diplom thesis *The Linux Kernel.*

Professional Experience

- 2005 – present **Freelance, Consultant, Instructor, Software Architect and Engineer, Sarajevo.**
Working as an independent consultant carrying out penetration tests and computer security consulting for major Bosnian companies. ▶ Writing custom courses and workshops and instructing on topics related to computer security, UNIX & Linux systems and programming. ▶ Developing and implementing solutions based on UNIX & Linux systems. ▶ Designing and developing small custom embedded hardware and firmware.
- 2014 – 2015 **Prime Time, Technology Consultant and Programmer, Sarajevo.**
Analyzed present conditions and developed new hardware and software solutions to automate and optimize workflows in the 3D Animation production pipeline. ▶ Developed an easy-to-use distributed rendering solution for Arnold and Houdini, enabling any user with no prior rendering experience to be trained in submitting new rendering jobs in a matter of minutes. ▶ Reduced rendering times by over 80% and saved more than 90% of temporary storage space and network bandwidth used during the rendering process.
- 2012 – 2013 **Vienna University of Technology, University Assistant, Austria.**
Worked as a teaching and research assistant (see under Teaching and Research Experience).
- 2003 – 2012 **Center for Computing Education, Instructor and System Administrator, Sarajevo.**
Taught courses on programming, TCP/IP, system and network administration (see under Teaching Experience). ▶ Managed systems essential for lectures and hands-on labs, including PCs with Linux systems, Cisco routers and switches, NDG NETLAB AE server, SUN Microsystems Ultra workstations, Enterprise and Netra servers and StorEdge disk arrays.
- 2007 – 2011 **CEDES.BA, Consultant, Software Architect and Programmer, Sarajevo.**
Carried out penetration tests for Bosnian companies. ▶ As a member of a team of software engineers, wrote a fast, secure, web-based Learning Management System (LMS), deployed in several large companies and used by thousands of users. ▶ Served as one of the chief architects of the underlying web application framework, on top of which the LMS was built.

2002 – 2006 **Rent a Coder**, *Freelance Programmer*, Online, <http://www.rentacoder.com/>.
Carried out around 30 programming projects, receiving the highest rating (10.0 out of 10.0) for all of them. ▶ Interesting projects include: Windows PE loader and runtime patcher; copy protection for downloaded documents; a sensitive hashing algorithm for anti-spam software; multiple systems for software installation, activation and update.

2003 – 2004 **DNC – AQSA InfoSec**, *Penetration Tester and Programmer*, Sarajevo.
Actively contributed in the process of establishing the first Bosnian commercial computer security lab. ▶ Carried out network penetration tests for local and foreign clients. ▶ Wrote custom security tools to support the penetration testing process.

Research Experience

2010 – present **University of Sarajevo**, *Member of the SAMOPHYS Research Group*, Sarajevo.
Built a 21-node 92-core Linux cluster used by the members of the SAMOPHYS research group for scientific computations in theoretical laser physics. ▶ Wrote software to simplify cluster usage and management and help reduce power consumption. ▶ Cooperating with other members of the group on parallelization of existing algorithms to speed up exhaustive calculations [5, 6].

2008 – present **Universiti Kebangsaan Malaysia (UKM)**, *External Associate Researcher*, Malaysia.
Actively cooperating with Professor Ahmed Patel from the National University of Malaysia (UKM) on various research projects as an external associate researcher. ▶ Published multiple research papers resulting from this cooperation [2, 3, 7, 8, 9, 10, 11].

2012 – 2013 **Vienna University of Technology**, *University Assistant*, Austria.
Carried out research in the areas of analysis and control of system software and cyber-physical systems, runtime verification and model checking at the Institute for Computer Engineering, TU Vienna [1, 4].

2010 **Magister Thesis**: *Development of a Fuzzy Logic Algorithm to Support Intelligent Process Scheduling in the Linux Operating System*.
Investigated uses of fuzzy logic to supplement Linux process scheduling with artificial intelligence. ▶ Implemented a fuzzy inference system in C to track process activity at runtime and dynamically adjust scheduling priorities to favor active processes.

2003 **Diplom Thesis**: *The Linux Kernel*.
Described the major features and architecture of the Linux kernel. ▶ Wrote an entire file system to demonstrate the process of integrating a specific low-level file system into the Linux Virtual File System layer. ▶ Implemented a loadable kernel module for encryption and decryption of files on top of the new file system.

Teaching Experience

2012 – 2013 **Vienna University of Technology**, *University Assistant*, Austria.
Taught undergraduate courses on practical aspects of *Operating Systems* and *Operating System Development* to around 230 students. ▶ Designed new exam programming tasks, wrote programs for automated exam grading, and administered practical exams.

2003 – 2012 **Center for Computing Education**, *Instructor*, Sarajevo.
Taught courses on UNIX fundamentals, as well as networking and basic router and switch administration (CCNA level) at the Cisco Networking Academy. Held an average rating of 4.77 out of 5.0 for CCNA and UNIX instruction based on the feedback from around 400 students. ▶ Led instruction in the SUN Academic Initiative program, teaching SUN Solaris fundamentals, system and network administration, as well as UNIX shell programming. Received an average rating of 4.93 out of 5.0 for Solaris instruction from a total of 90 students. ▶ Acted as a lead instructor in the Linux Professional Institute (LPI) program.

- 2011 – 2012 **University of Sarajevo**, *Visiting Lecturer*, Sarajevo.
Gave multiple lectures in the class on *Management Information Systems* at the Faculty of Economics, providing students with complementary knowledge from the fields of computer security, computer networks and Internet technologies.
- 2008 – 2011 **CEDES.BA**, *Curriculum Designer and Instructor*, Sarajevo.
Developed and taught custom hands-on curricula on *Offensive Security* and *Computer Forensics* for the Bosnian Civil Service Agency and Bosnian Federal Police Administration.
- 2009 **Universiti Kebangsaan Malaysia (UKM)**, *Visiting Lecturer*, Bangi, Malaysia.
Designed and taught a one-week seminar on *Linux Design, Maintenance and Programming* for selected members of the Faculty of Information Science and Technology at the National University of Malaysia (UKM).
- 1999 – 2005 **First Bosniak High School**, *Teacher of Computer Programming*, Sarajevo.
Taught Pascal, C and x86 Assembly programming languages, data structures and algorithms. ▶ Selected and trained best students for programming contests, in particular:
- ▶ Festival of Work of Bosnian High Schools (2000), 1st place
 - ▶ Cantonal High School Programming Contest (2002), 2nd place
 - ▶ Cantonal High School Programming Contest (2003), 1st and 2nd place
 - ▶ Bosnia and Herzegovina Olympiad in Informatics, BHOI (2005), 2nd place
 - ▶ Central-European Olympiad in Informatics, CEOI (2005), participation
 - ▶ International Olympiad in Informatics, IOI (2005), participation

Skills

- Areas** Computer programming, computer security, operating systems, instruction.
- Programming** C, C++, x86 Assembly, UNIX Shell(s), PHP, Object Pascal (Delphi), Python.
- Systems** UNIX and Linux.
- Languages** English (fluent), Bosnian (native), German (fluent), Arabic (basic).

Awards and Distinctions

- 2007 – 2008 **Official instructor of the Bosnian Civil Service Agency**.
Appointed as an official instructor of the Bosnian Civil Service Agency IT staff for computer network design, implementation and administration.
- 2003 **Recognition by the Ministry of Education and Science**.
Awarded a Certificate of Merit from the Ministry of Education and Science of the Sarajevo Canton for success in preparing students for the cantonal programming contest.

Additional Information

- Peer Review** Reviewer for Elsevier Computer Standards and Interfaces (CSI) since 2010.
- Open Source** Developed a fuzzy logic algorithm for imitating human perception of color. Implemented the algorithm in C and contributed the code to *libnetpbm* (merged in version 10.34).
- Membership** ACM (*Student member*, 2007–2009); USENIX (*Student member*, 2007).
- Certificates** LPI (Advanced Level Linux Professional – LPIC-2) ▶ CompTIA (Linux+, Security+) ▶ SUN Microsystems (SUN Certified System Administrator – SCSA; SUN Certified Network Administrator – SCNA) ▶ Cisco (Cisco Certified Network Professional – CCNP; Cisco Certified Academy Instructor – CCAI) ▶ IBM (AIX Specialist) ▶ Novell (Novell Certified Linux Administrator; Novell PartnerNet Data Center Specialist).

List of Publications

- [1] **Kenan Kalajdzic**, Cyrille Jégourel, Ezio Bartocci, Axel Legay, Scott A. Smolka, and Radu Grosu. Model Checking as Control: Feedback Control for Statistical Model Checking of Cyber-Physical Systems. *CoRR*, abs/1504.06660, 2015. <http://arxiv.org/abs/1504.06660>.
- [2] **Kenan Kalajdzic**, Samaher Al-Janabi, and Ahmed Patel. Rapid Lossless Compression of Short Text Messages. *Computer Standards & Interfaces*, Volume 37, Pages 53–59, January 2015. <http://dx.doi.org/10.1016/j.csi.2014.05.005>.
- [3] Samaher Al-Janabi, Ahmed Patel, Hayder Fatlawi, **Kenan Kalajdzic**, Ibrahim Al-Shourbaji. Empirical rapid and accurate prediction model for data mining tasks in cloud computing environments. In *Proceedings of the International Congress on Technology, Communication and Knowledge (ICTCK 2014)*, Pages 1–8, IEEE, November 2014. <http://dx.doi.org/10.1109/ictck.2014.7033495>.
- [4] **Kenan Kalajdzic**, Ezio Bartocci, Scott A. Smolka, Scott D. Stoller, and Radu Grosu. Runtime Verification with Particle Filtering. In *Proceedings of the Fourth International Conference on Runtime Verification (RV 2013)*, Pages 149–166, 2013. http://dx.doi.org/10.1007/978-3-642-40787-1_9.
- [5] Benjamin Fetic, **Kenan Kalajdzic**, and Dejan B. Milosevic. High-Order Harmonic Generation by a Spatially Inhomogeneous Field. *Annalen der Physik*, 525(1-2):107–117, 2013. <http://dx.doi.org/10.1002/andp.201200184>.
- [6] Aner Cerbic, Mustafa Busuladzic, Elvedin Hasovic, Azra Gazibegovic-Busuladzic, Senad Odzak, **Kenan Kalajdzic**, and Dejan B. Milosevic. Ellipticity Dependence of Plateau Structures in Atomic and Molecular Processes in a Strong Laser Field. *Physica Scripta*, 2012(T149):014044, May 2012. <http://dx.doi.org/10.1088/0031-8949/2012/t149/014044>.
- [7] Ahmed Patel, **Kenan Kalajdzic**, Laleh Golaifshan, and Mona Taghavi. Design and Implementation of a Zero-Knowledge Authentication Framework for Java Card. *International Journal of Information Security and Privacy*, 5(3):1–18, July–September 2011. <http://dx.doi.org/10.4018/ijisp.2011070101>.
- [8] **Kenan Kalajdzic**, Ahmed Patel, and Mona Taghavi. Two Methods for Active Detection and Prevention of Sophisticated ARP-Poisoning Man-in-the-Middle Attacks on Switched Ethernet LANs. *International Journal of Digital Crime and Forensics, Special Issue from the Sixth International Annual Workshop on Digital Forensics and Incident Analysis*, 3(3):50–60, July–September 2011. <http://dx.doi.org/10.4018/jdcf.2011070104>.
- [9] **Kenan Kalajdzic** and Ahmed Patel. Active Detection and Prevention of Sophisticated ARP-Poisoning Man-in-the-Middle Attacks on Switched Ethernet LANs. In *Proceedings of the Sixth International Workshop on Digital Forensics & Incident Analysis (WDFIA 2011)*, Pages 81–92, University of Plymouth, 2011.
- [10] **Kenan Kalajdzic** and Ahmed Patel. A Fast Practical Method for Recovery of Lost Files in Digital Forensics. *Journal of Internet Technology (JIT), Special Issue: Advanced Security Services for Future Communications and Computing*, 10(5):575–581, 2009.
- [11] **Kenan Kalajdzic** and Ahmed Patel. A Fast Scheme for Recovery of Deleted Files with Evidential Recording for Digital Forensics. In *Proceedings of the Fourth International Workshop on Digital Forensics & Incident Analysis (WDFIA 2009)*, Pages 15–25, University of Plymouth, 2009.