Giorgos Kappes

Postdoctoral researcher with expertise on Computer Systems

Personal Information

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Military Service	Fulfilled

Profile

Giorgos Kappes is a postdoctoral researcher at the Computer Systems Lab of the Department of Computer Science and Engineering, University of Ioannina, Greece. He holds a Ph.D degree in Computer Science, an M.Sc degree in Computer Systems and a B.Sc degree from the above department. His Ph.D work focused on data-intensive cloud systems. Giorgos has extensive experience in conducting research in computer systems. His research includes the design, development, and evaluation of system software for multitenant cloud environments. His research interests include operating systems, data storage, and systems security. Giorgos is also an expert in deployment and administration of enterprise-level IT infrastructure with over ten years of hands-on experience.

Education

Doctor of Philosophy (Ph.D) degree   *Jun 2021*
Department of Computer Science & Engineering, University of Ioannina, Greece.
  ⋄ Dissertation: "User-level Services for Multitenant Isolation"
  ⋄ *Supervisor:* Stergios V. Anastasiadis.
  ⋄ Grade: "Excellent"

Master of Science (M.Sc) degree   *Oct 2013*
Department of Computer Science & Engineering, University of Ioannina, Greece.
  ⋄ *Specialization:* Computer Systems.
  ⋄ *Thesis:* "Scalable Access Control for Secure Multitenant Filesystems".
  ⋄ *Supervisor:* Stergios V. Anastasiadis.
  ⋄ *GPA:* 9.1/10 ("Excellent").

Bachelor of Science (B.Sc) Degree in Computer Science   *Feb 2011*
Department of Computer Science, University of Ioannina, Greece.
  ⋄ *Thesis:* "Logging File Access Patterns for a More Efficient File Search on Filesystems".
  ⋄ *Supervisor:* Stergios V. Anastasiadis.
  ⋄ *GPA:* 6.82/10 ("Very Good").

Experience

Co-Founder   *Jun 2024 - Today*

Polytropo Systems
  ⋄ Co-founded Polytropo Systems PC, a startup business as spinoff from the University of Ioannina, Greece. The main company activities include the design and implementation of systems software for serving data-intensive applications in private or public cloud infrastructures along with the related consulting services for supporting the software integration into the customer facilities.

◇ Profile of Polytropo Systems PC in the National Startup Registry: https://registry.elevategreece.gov.gr/company/polytropo/

Adjunct Lecturer *Oct 2024 - Today*

Department of Computer Science & Engineering, University of Ioannina, Greece.
◇ Spring Semester: Simulation and Modeling of Computer Systems.

Postdoctoral Research Associate *Nov 2023 - Today*

Research project "Towards Predictable Performance in Elastic, Reliable and Secure Multitenant Systems (TOPPERS)".
◇ Resource isolation and elasticity in multitenant systems, security and reliability in multitenant systems, writing of scientific publications.

Research Associate *Nov 2022 - Feb 2023*

Research project "HOMORE: Smart system for monitoring the normal living conditions of elder people in urban and rural areas".

◇ Integration of data acquisition devices, storage systems, processing and display systems

Adjunct Lecturer *Mar 2022 - Sep 2022*

Department of Computer Science & Engineering, University of Ioannina, Greece.
◇ Spring Semester: Simulation and Modeling of Computer Systems.

Postdoctoral Research Associate *Dec 2021 - Sep 2023*

Research project "Dioni: Computing Infrastructure for Big-Data Processing and Analysis", November 2020-May 2023, Regional Excellence, Operational Program of Competitiveness, Entrepreneurship & Innovation, Ministry of Development and Investments (co-funded by European Union).
◇ Secure sharing of scientific data, hosting of the computer services of third-party organizations, strengthening the entrepreneurship for start-ups.
◇ Design and implementation of the experimental and operational system architecture for data storage and application management.

Engineer *May 2021 - Dec 2021*

Research project "Dioni: Computing Infrastructure for Big-Data Processing and Analysis", November 2020-May 2023, Regional Excellence, Operational Program of Competitiveness, Entrepreneurship & Innovation, Ministry of Development and Investments (co-funded by European Union).
◇ Secure sharing of scientific data, hosting of the computer services of third-party organizations, strengthening the entrepreneurship for start-ups.
◇ Design and implementation of the experimental and operational system architecture for data storage and application management.

Research Associate *Mar 2019 - Feb 2021*

Research project "Ofidia2: Operational Fire-Danger Prevention Platform 2", Interreg "Greece-Italy 2014-2020".
Department of Computer Science & Engineering, University of Ioannina, Greece.
◇ Design and implementation of the experimental and operational system architecture for data storage and application management.

Computer Systems Analyst and Programmer *Jul 2018 - Jan 2019*

Research and Informatics Corps, 8th Motorized Infantry Brigade, Hellenic Army General Staff, Greece.

Research Associate *Feb 2014 - Nov 2014*

Research project "Ofidia: Operational Fire-Danger Prevention Platform", European Territorial Cooperation Programme "Greece-Italy 2007-2013".
Department of Computer Science & Engineering, University of Ioannina, Greece.
◇ *Storage:* Design of storage models for climate-change data. In particular, determination of models for storing and processing scientific data on multicore systems and virtual machines.

⋄ *Administration:* Installation, configuration and management of the operational data center nodes and virtual machines of the Ofidia platform. Automatic monitoring and troubleshooting of the Ofidia platform services.

⋄ *Evaluation:* Performance analysis of the Ofidia platform and optimizations.

Systems and Network Administrator   *Mar 2011 - Today*

Systems Research Group, Department of Computer Science & Engineering, University of Ioannina, Greece.

⋄ *Hardware:* Installations, upgrades, and management of Enterprise-level Rack Nodes, Data Storage Arrays, and Network Switches.

⋄ *Storage:* Management of NetApp ONTAP, including storage provisioning, capacity, and aggregate planning, failover, snapshots for data protection, network-attached storage for file-level storage access and storage area networks for block-level storage access. Installations, management, and performance analysis of distributed storage systems, including Ceph, GlusterFS, and NFS.

⋄ *Virtualization:* Installations, deployment, management, and performance monitoring of Xen Hypervisor and Xen Virtual Machines.

⋄ *Operating Systems:* Installations, automated deployments (Clonezilla Server), centralized user administration (NIS), security policy specification (SELinux), monitoring (Ganglia), kernel configuration, installations and configuration of server and database software, deployment of storage redundancy and flexibility solutions, such as RAID and LVM, backup management (rsnapshot), and power device monitoring (nut).

⋄ *Networking:* Gateway configuration, creation of firewall rules for secure routing and port management (iptables), link aggregation for redundancy and throughput.

Teaching assistant   *Mar 2011 - Jun 2021*

Department of Computer Science & Engineering, University of Ioannina, Greece.

⋄ *Courses:* Operating Systems, Computer Systems Security.

Systems Support   *Sep 2009 - Jan 2010*

Department of Computer Science, University of Ioannina, Greece.

⋄ System administration and maintenance.

Publications

Journal Papers

⋄ Giorgos Kappes, Stergios V. Anastasiadis, **Diciclo: Flexible User-level Services for Efficient Multitenant Isolation**, ACM Transactions on Computer Systems (TOCS), vol. 42, issue 1-2, May 2024, pg. 3:1-47.

⋄ Giorgos Kappes, Stergios V. Anastasiadis, **A Family of Relaxed Concurrent Queues for Low-latency Operations and Item Transfers**, ACM Transactions on Parallel Computing (TOPC), vol. 9, no. 4, December 2022, pg. 16:1-16:37.

⋄ Giorgos Kappes, Stergios V. Anastasiadis, **Diciclo: Data-Intensive Container Isolation for Multitenant Clouds: Building user-level services for multitenant container storage**, USENIX ;login:, December 2021.

⋄ Giorgos Kappes, Andromachi Hatzieleftheriou, Stergios V. Anastasiadis, **Multitenant Access Control for Cloud-Aware Distributed Filesystems**, IEEE Transactions on Dependable and Secure Computing (TDSC), Nov-Dec 2019, pg. 1070- 1085.

Conference Papers

⋄ Giorgos Kappes, Stergios V. Anastasiadis, **Faster FUSE Filesystems with Efficient Data Transfers**, ACM SIGOPS Asia-Pacific Workshop on Systems (APSys), Kyoto, Japan, September 2024, pp. 122-129.

⋄ Georgios C. Androutsopoulos, Giorgos Kappes, Stergios V. Anastasiadis, **Quantifying the Security Profile of Linux Applications**, ACM SIGOPS Asia-Pacific Workshop on Systems (APSys), Seoul, Republic of Korea, August 2023, pp. 80-86.

⋄ Giorgos Kappes, Stergios V. Anastasiadis, **Danaus: Isolation and Efficiency of Container I/O at the Client Side of Network Storage**, ACM/IFIP Middleware International Conference (Middleware 2021), Virtual Event, Quebec, Canada, December 2021, pp. 132-145.

⋄ Giorgos Kappes, Stergios V. Anastasiadis, **Asterope: A Cross-Platform Optimization Method for Fast Memory Copy**. 11th ACM Workshop on Programming Languages and Operating Systems (PLOS 2021), Virtual Event, October 2021, pp. 9-16.

⬦ Giorgos Kappes, Stergios V. Anastasiadis, **A Lock-free Relaxed Concurrent Queue for Fast Work Distribution**, ACM SIGPLAN Symposium on Principles and Practice of Parallel Programming (PPoPP), Virtual Event, Republic of Korea, February 2021, pp. 454-456.

⬦ Giorgos Kappes, Stergios V. Anastasiadis, **A user-level Toolkit for Storage I/O Isolation on Multitenant Hosts**, ACM Symposium on Cloud Computing (SoCC), Virtual Event, USA, October 2020, pp. 74-89.

⬦ Giorgos Kappes, Stergios V. Anastasiadis, **Libservices: Dynamic Storage Provisioning for Multitenant I/O Isolation**, ACM SIGOPS Asia-Pacific Workshop on Systems (APSys), Tsukuba, Japan, August 2020, pp. 33-41.

⬦ Giorgos Kappes, Andromachi Hatzieleftheriou, Stergios V. Anastasiadis, **Virtualization-aware Access Control for Multitenant Filesystems**, IEEE International Conference on Massive Storage Systems and Technology (MSST), Santa Clara, CA, USA, June 2014, pp. 1-6.

Patents

⬦ Giorgos Kappes, Stergios V Anastasiadis, **User-level services for multitenant isolation**, U.S. Patent Application 20230054696, filed August, 10, 2022, status pending final publication.

Invited Talks

Virtualization-aware Access Control for Multitenant Filesystems *Sep 2014*

15th TERENA TF-Storage Task Force Meeting, Uppsala, Sweden.

Reviewing Experience

⬦ 30th International European Conference on Parallel and Distributed Computing, August 2024 (member of Posters and Demos Committee).

⬦ European Conference on Computer Systems 2024 (EuroSys 2024), April 2024 (heavy PC member of shadow PC).

⬦ Conference on Principles of Distributed Systems 2023 (OPODIS 2023), October 2023 (external reviewer).

⬦ The Computer Journal, Oxford University Press.

Academic Services

⬦ Member of the Examining Committee in 9 Dipl. Eng. Theses.

Skills

Native Languages	Greek.
Other Languages	English, Level B2 "First Certificate In English".
Driver License	European Category B.
Systems Design	Extensive experience ($>$ 10 years) in design, implementation, and analysis of virtualization storage systems for multitenant cloud platforms.
Systems Security	Extensive experience ($>$ 10 years) in design of security protocols, threat modeling, security analysis of virtualization storage systems, hardening of operating systems and application services (SELinux, AppArmor), monitoring of security incidents, cryptography, authentication and authorization protocols (e.g., Kerberos), hardware-level security (TPM, Intel SGX).
Storage Systems	Extensive experience ($>$ 10 years) in installation, configuration, analysis, and improvement of enterprise-level storage systems, such as Ceph, GlusterFS, and NFS.
Virtualization and Cloud Platforms	Extensive experience ($>$ 10 years) in installation, configuration, management, and usage of Xen, VMware Workstation, Oracle Virtual Box, Docker, LXC, Amazon Web Services (AWS), Kubernetes, OpenStack.

Network Services	Extensive experience ($>$ 10 years) in installation, configuration and management of network services like web (apache, nginx, lighttpd), SQL servers (MySQL, PostgreSQL), NoSQL servers (MongoDB), network gateways (NAT, DHCP, DNS), firewalls (iptables), VPNs (OpenVPN, IPsec), authentication and authorization services (NIS, LDAP, Active Directory, Kerberos), email services (postfix, sendmail), monitoring systems (Ganglia), software switches (Open vSwitch, Linux Bridge), hardware switches (e.g., HP ProCurve).
Operating Systems	Extensive experience ($>$ 10 years) in installation, configuration, and management of GNU/Linux, Microsoft Windows Server/Desktop, Oracle Solaris, NetApp ONTAP.
Programming Languages	C, C++, Fortran, Java, SQL, Python, Bash, HTML/ CSS, Linux kernel, Windows Filter Drivers (Windows Driver Model), OpenMP, MPI, pthreads, OpenSSL, Crypto++.
Miscellaneous	Strong oral and written communication skills, excellent troubleshooting and debugging skills, excellent problem solving skills, excellent team skills.

Awards

Usenix student grant *Sep 2014*

From Usenix Association to attend the 11th USENIX Symposium on Operating Systems Design and Implementation (OSDI 2014) in Broomfield, CO, USA.

ACM Scholarship *Feb 2013*

From ACM Association to attend the 2013 European Conference on Computer Systems (EuroSys 2013) in Prague, Czech Republic.

Interests

Research	Operating systems, cloud computing, data storage, systems security.
Sports	Running, cycling and swimming.
Aviation	Flight planning and flying with flight simulators.
Technology	Writing open-source utilities, retro computing.

References

Available upon request.