



Curriculum Vitae

Georgios P. Katsikas

Ph.D., Computer & Networked Systems



N. Smyrni 17123, Attica, Greece



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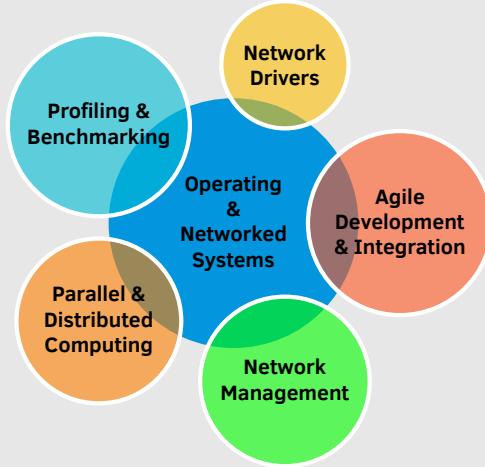


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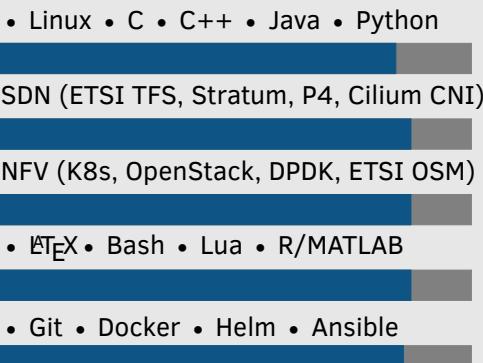


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Technical Skills Overview



Programming



Summary

My interests include Computer Networks and Operating Systems with a focus on Network Functions Virtualization (NFV) and Software-Defined Networking (SDN). In my [doctoral thesis](#), I introduced how to realize NFV service chains at the emerging and utterly challenging link speeds at 100 Gbps using commodity hardware, while obliterating latency. My latest research is published at top systems conferences ([USENIX NSDI'18](#), [ACM CoNEXT'19](#), [USENIX NSDI'22](#)) and journals ([ACM TOCS'21](#)) and featured in the [ACM Technews](#), [PHYS.ORG](#), [ECN](#), [KTH](#), and [APNIC](#). I have been actively contributing to cutting edge networking frameworks, such as [ONOS](#), [DPDK](#), [ETSI TFS](#), and the [Click modular router](#).

Experience

Nov. 2019	Senior SDN/NFV R&D Engineer & Product Owner	UBITECH
Present	On a mission to design and implement a state-of-the-art service and resource orchestrator for modern 5G and beyond infrastructures using:	
	<ul style="list-style-type: none"> • Standardized TM Forum service and resource APIs. • Open Infrastructure as Code tools combining Kubernetes and git. • A programmable cloud-native 5G software stack. • An SDN fabric in P4 through contributions to ETSI standards. 	
	<u>Tools</u> : Kubernetes, OpenStack, Stratum (P4), DPDK, Open5GS, gitops.	
	<u>Hardware</u> : AMD EPYC architecture, 200 GbE NVIDIA Bluefield-2 and 100 GbE Xilinx Alveo SN 1000 SmartNICs, 400 GbE Intel Tofino-2 P4 switch, NVIDIA JETSON GPUs, and Amarisoft & ETTUS 5G hardware.	
Oct. 2019	Post Doctoral Researcher	KTH NSLab
Oct. 2020	<ul style="list-style-type: none"> • Reframer packet scheduler for low latency Internet services. • Benchmarked the classifiers of 100-200 GbE Mellanox NICs. 	
	<u>Tools</u> : DPDK, Click, OVS, Mellanox drivers, and DevOps.	
	<u>Hardware</u> : Intel architectures and Mellanox Smart NICs.	
Feb. 2019	Military Service	Computer Science and Research Division @ Greek Army
Oct. 2019	Networked systems engineer at the Department of Networking.	
Oct. 2018	Post Doctoral Researcher	KTH NSLab
Dec. 2018	<ul style="list-style-type: none"> • Integrated NFV service chains with blackboxes at 100 Gbps. • Designed RSS++ for intra-server load-balancing at 100 Gbps. 	
	<u>Tools</u> : Linux, ONOS, DPDK, Click, SR-IOV, KVM, and DevOps.	
	<u>Hardware</u> : Intel architectures and Mellanox NICs.	
May. 2017	Industrial Ph.D. Student	RISE and KTH NSLab
Sep. 2018	<ul style="list-style-type: none"> • Implemented Metron for NFV service chaining at 100 Gbps. • Implemented dynamic scaling techniques for NFV 10 Gbps. 	
	<u>Tools</u> : ONOS, DPDK, Click, OpenFlow, REST, and DevOps.	
	<u>Hardware</u> : Intel architecture, Mellanox NICs, and OpenFlow switches.	
Jul. 2014	Licentiate Student (Halfway to Ph.D.)	KTH NSLab
Apr. 2017	<ul style="list-style-type: none"> • Synthesized the internal operations of NFV service chains with SNF, enabling complex chains to operate at line-rate 40 Gbps. • Combined profiling and task scheduling techniques with I/O batching (SCC) to reduce the latency of traversing NFV chains. 	
	<u>Tools</u> : Linux, Perf, Intel PCM, DPDK, ixgbe, Click, OpenFlow, and Git.	
	<u>Hardware</u> : Intel architecture, Intel NICs, and OpenFlow switches.	
Oct. 2013	Research Assistant	IMDEA Networks
Jun. 2014	<ul style="list-style-type: none"> • Integrated heterogeneous SDN control planes. 	
	<u>Tools</u> : Linux, OpenDaylight, Ryu/POX, Mininet, OpenFlow, and SVN.	
Apr. 2010	Research Assistant	NKUA SCAN Lab
Sep. 2013	<ul style="list-style-type: none"> • Developed Machine Learning techniques for autonomic network management in heterogeneous wireless networks. 	
	<u>Tools</u> : Linux (OpenWrt), Java, REST, and SVN.	



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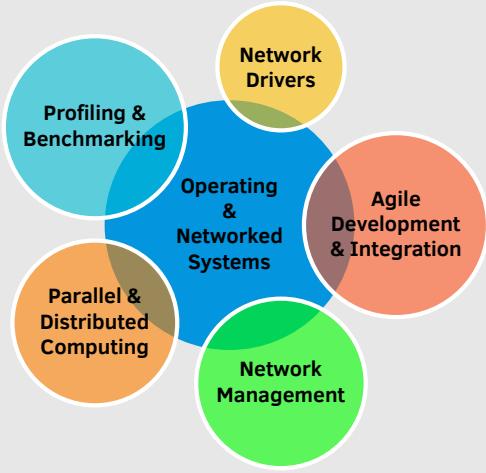


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Technical Skills Overview



Programming

- Linux • C • C++ • Java • Python



- L^AT_EX • Bash • Lua • R/MATLAB



Education

- Jul. 2014 - Sep. 2018 **Ph.D. in Computer Science and Networked Systems**
KTH Royal Institute of Technology,
School of Electrical Engineering and Computer Science,
Department of Communication Systems.
- Oct. 2010 - Dec. 2012 **M.Sc. in Telecommunication Systems and Networks**
National and Kapodistrian University of Athens,
School of Science,
Department of Informatics and Telecommunications.
- Oct. 2005 - Jun. 2010 **B.Sc. in Computer Science and Networked Systems**
National and Kapodistrian University of Athens,
School of Science,
Department of Informatics and Telecommunications.

Languages

Greek Native speaker

English Certificate of Proficiency in English
University of Michigan.

French Diplôme d' études en langue Française (DELF) 2^{eme} degré (A5 and A6)
French Institute, Greece.

Distinctions, Awards, and Honors

- 2022 **USENIX NSDI 2022 community award winner**
Best paper whose code and/or data set was made publicly available.
- 2019 **Acknowledged quality code contributions by the ONOS TST**
Responsible for maintaining ONOS's server device driver.
- 2018 **USENIX NSDI publication impact**
Our paper was featured in ACM Technews, PHYS.ORG, ECN, KTH, & APNIC.
- 2011 **Best paper award**
Awarded by UBICOMM 2011. Received invitation for journal publication.
- 2011 **Ranked 1st in my class**
First year ranking of my Master's class (GPL: 8.84/10 with honors).

Talks

- 2021 Video of my talk at PAM on [\(Smart\) Network Interface Cards](#).
- 2018 Video of my talk at USENIX NSDI on our work [Metron](#).

Theses

- 2018 **Doctoral Thesis**
[“NFV Service Chains at the Speed of the Underlying Commodity Hardware”](#)
KTH Royal Institute of Technology & RISE SICS.
- 2016 **Licentiate Thesis**
[“Realizing High Performance NFV Service Chains”](#)
KTH Royal Institute of Technology.
- 2012 **Master Thesis**
[“Cognitive self-Management for VoIP Quality of Service in Wireless Networks: Design and Performance Evaluation”](#)
National and Kapodistrian University of Athens.
- 2010 **Bachelor Thesis**
[“Feedback-based learning for Self-Managed Network Elements”](#)
National and Kapodistrian University of Athens.



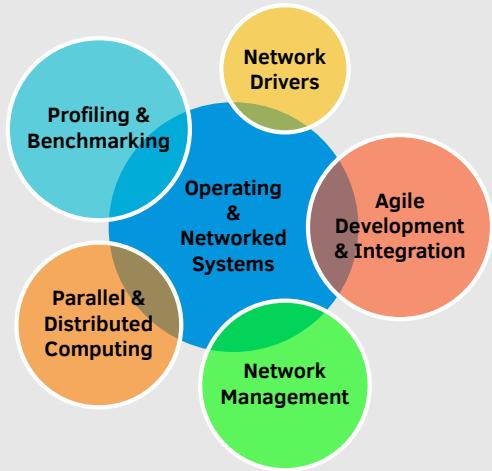
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Programming

- Linux • C • C++ • Java • Python
- SDN (ETSI TFS, Stratum, P4, Cilium CNI)
- NFV (K8s, OpenStack, DPDK, ETSI OSM)
- L^AT_EX • Bash • Lua • R/MATLAB
- Git • Docker • Helm • Ansible

Conference Publications

- 2022 [“Packet Order Matters! Improving Application Performance by Deliberately Delaying Packets”](#)
Hamid Ghasemirahni, Tom Barbette, Georgios P. Katsikas, Alireza Farshin, Massimo Girondi, Amir Roozbeh, Marco Chiesa, Gerald Q. Maguire Jr., and Dejan Kostić, 19th USENIX Symposium on Networked Systems Design and Implementation ([NSDI](#)), Renton, WA, U.S., April 4-6 2022.
- 2021 [“What You Need to Know About \(Smart\) Network Interface Cards”](#)
Georgios P. Katsikas, Tom Barbette, Marco Chiesa, Dejan Kostić, and Gerald Q. Maguire Jr., Passive and Active Measurement Conference ([PAM](#)), Cottbus-Senftenberg, Germany, March 29-31 2021.
- 2021 [“TeraFlow: Secured Autonomic Traffic Management for a Tera of SDN flows”](#)
R. Vilalta et al., Joint European Conference on Networks and Communications (EuCNC) 6G Summit, Porto, Portugal, June 2021.
- 2019 [“RSS++: load and state-aware receive side scaling”](#)
Tom Barbette, Georgios P. Katsikas, Gerald Q. Maguire Jr., and Dejan Kostić, 15th International Conference on emerging Networking EXperiments and Technologies ([CoNEXT](#)), Orlando, Florida, U.S., December 9-12 2019.
- 2018 [“Metron: NFV Service Chains at the True Speed of the Underlying Hardware”](#)
Georgios P. Katsikas, Tom Barbette, Dejan Kostić, Rebecca Steinert, and Gerald Q. Maguire Jr., 15th USENIX Symposium on Networked Systems Design and Implementation ([NSDI](#)), Renton, WA, U.S., April 9-11 2018.
- 2013 [“A Scheme for Adaptive Self-Diagnosis of QoS Degradation in Future Networks”](#)
Panagiotis Spapis, Panagiotis Theodoropoulos, George Katsikas, Nancy Alonistioti, and Stylianos Georgoulas, IFIP International Symposium on Integrated Network Management (IM), Ghent, Belgium, May 27-31 2013.
- 2013 [“Network & service governance for the management of future networks”](#)
Beatriz Fuentes, Eleni Patouni, Teemu Rautio, Evangelos Kosmatos, Roi Arapoglou, and George Katsikas, IEEE Future Network & Mobile Summit, Lisbon, Portugal, July 3-5 2013.
- 2013 [“A dynamic governance framework for efficient orchestration of hetnet empowerment mechanisms”](#)
Roi Arapoglou, Konstantinos Chatzikokolakis, George Katsikas, and Nancy Alonistioti, IEEE International Conference on Smart Communications in Network Technologies (SaCoNeT), Paris, France, June 17-19 2013.
- 2012 [“On accomplishing context awareness for autonomic network management”](#)
Beatriz Fuentes, Aimilia Bantouna, Leila Bennacer, Giorgio Calochira, Majid Ghader, George Katsikas, and Zarrar Faqir Yousaf, IEEE Future Network & Mobile Summit (FNMS), Berlin, Germany, July 4-6 2012.
- 2012 [“Video-to-Video for e-Health: Use Case, Concepts and Pilot Plan”](#)
Makis Stamatelatos, George Katsikas, Petros Makris, Nancy Alonistioti, Serafeim Antonakis, Dimitrios Alonistiotis, and Panagiotis Theodossiadis, Artificial Intelligence Applications and Innovations (AIAI), Chalkidiki, Greece, September 27-28 2012.
- 2011 [“Learning Enhanced Environment Perception for Cooperative Power Control”](#)
Panagiotis Spapis, George Katsikas, Makis Stamatelatos, Konstantinos Chatzikokolakis, Roi Arapoglou, and Nancy Alonistioti, Mobile Ubiquitous Computing, Systems, Services and Technologies (UBICOMM), Lisbon, Portugal, November 20-25 2011.
- 2011 [“Feedback-based Learning for Self-Managed Network Elements”](#)
Panagis Magdalinos, Apostolos Kousaridas, Panagiotis Spapis, Giorgos Katsikas, and Nancy Alonistioti, IFIP International Symposium on Integrated Network Management (IM), Dublin, Ireland, May 23-27 2011.



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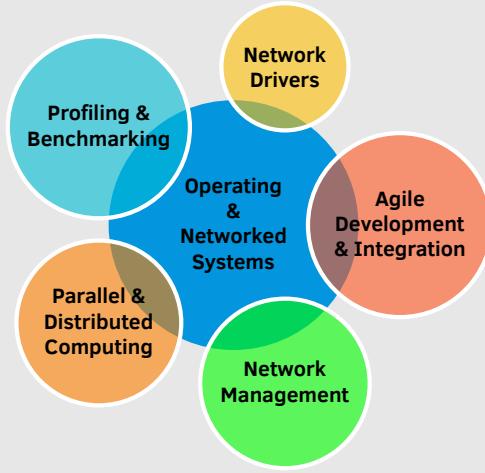


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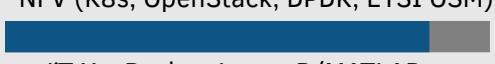


Programming

- Linux • C • C++ • Java • Python



- SDN (ETSI TFS, Stratum, P4, Cilium CNI)



- L^AT_EX • Bash • Lua • R/MATLAB



Journal Publications

2022 "Drones in B5G/6G Networks as Flying Base Stations"

Georgios Amponis, Thomas Lagkas, Maria Zevgara, Georgios P. Katsikas, Thanos Xirofotos, Ioannis Moscholios, and Panagiotis Sarigiannidis, *Drones* 2022, vol. 6, number 2, article 39.

2021 "Metron: High Performance NFV Service Chaining Even in the Presence of Blackboxes"

Georgios P. Katsikas, Tom Barbette, Dejan Kostić, Gerald Q. Maguire Jr., and Rebecca Steinert, *ACM Transactions on Computer Systems (TOCS)*, vol. 38, issue 1-2, article 3, pp 1-45 (July 2021).

2017 "Profiling and accelerating commodity NFV service chains with SCC"

Georgios P. Katsikas, Gerald Q. Maguire Jr., and Dejan Kostić, *Elsevier Journal of Systems and Software*, vol. 127C, p. 12-27.

2016 "SNF: Synthesizing high performance NFV service chains"

Georgios P. Katsikas, Marcel Enguehard, Maciej Kuźniar, Gerald Q. Maguire Jr., and Dejan Kostić, *PeerJ Computer Science*, vol. 2, p.e98.

2012 "Enhancing Environment Perception for Cooperative Power Control: an Experimental Perspective"

Panagiotis Spapis, George Katsikas, Konstantinos Chatzikokolakis, Roi Arapoglou, Makis Stamatelatos, and Nancy Alonistioti, *International Journal on Advances in Intelligent Systems (IARIA)*.

2011 "Enhancing a Fuzzy Logic Inference Engine through Machine Learning for a Self-Managed Network"

Panagis Magdalinos, Apostolos Kousaridas, Panagiotis Spapis, George Katsikas, and Nancy Alonistioti, *Mobile Networks and Applications (MONET)* Journal, Special Issue on Mobile Networks and Management.

Book Chapters

2013 "Spectrum Aggregation in Cognitive Radio Access Networks from Power control perspective"

Konstantinos Chatzikokolakis, Panagiotis Spapis, Makis Stamatelatos, George Katsikas, Roi Arapoglou, Alexandros Kaloxyllos, and Nancy Alonistioti, *Evolution of Cognitive Networks and Self-Adaptive Communication Systems*, IGI Global, 2013.

2011 "Testing End-to-End Self-Management in a Wireless Future Internet Environment"

Apostolos Kousaridas, George Katsikas, Nancy Alonistioti, Esa Piri, Marko Palola, and Jussi Mäkinen, *The Future Internet Assembly (FIA)*, pp 259-270, ISBN 978-3-642-20897-3, DOI: 10.1007/978-3-642-20898-0_19, Springer, Berlin, Heidelberg, 2011.

Projects

Jan. 2023 - Present **ACROSS, INCODE, FIDAL**

European Union Horizon JU SNS 2022.

Jan. 2021 - Present **TERMINET, Int5GEnt, 5G-INDUCE, TeraFlow**

European Union Horizon 2020.

Oct. 2018 - Oct. 2020 **Increasing the Spatial Correlation of Logical Units of Data to Enable an Ultra-Low Latency Internet (ULTRA)**

European Research Council (ERC).

Apr. 2017 - Dec. 2018 **Time-Critical Clouds (TCC)**

The Swedish Foundation for Strategic Research (SSF).

Jan. 2015 - Mar. 2017 **BEhavioural-BAsed forwarding (BEBA)**

European Union Horizon 2020.

Apr. 2010 - Sep. 2013 **Self-NET, CONSERN, SACRA, SmartAgriFood, LiveCity, UniverSelf, and METIS**

European Union 7th Framework Programme.



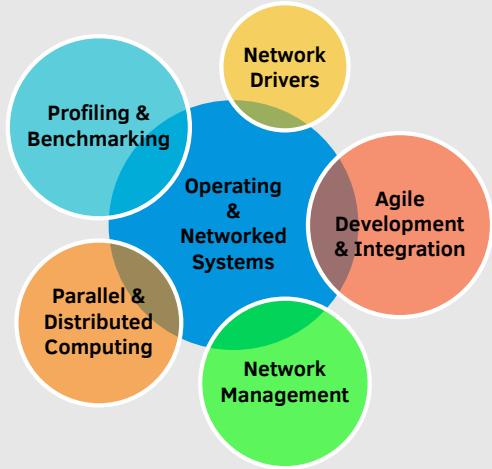
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- L^AT_EX • Bash • Lua • R/MATLAB
- Git • Docker • Helm • Ansible

Open Source Activities



Reframer: A packet reordering Network Function (NF)

Reframer is a [FastClick](#)-based NF that buffers, delays, and reorders incoming packets to increase spatial locality of network traffic. Joint work with [Hamid Ghasemirahni](#) and [Tom Barbette](#).



What You Need to Know About (Smart) Network Interface Cards

NIC classification benchmarks using [FastClick](#) & [DPDK](#). The NVIDIA-Mellanox mlx5 DPDK driver is extended to support direct rule updates. Joint work with [Tom Barbette](#).



RSS++: load and state-aware receive side scaling

Server-level load-balancing using [FastClick](#) & [DPDK](#) or our modified version of the [Linux kernel](#) with improved load-balancing features. Joint work led by [Tom Barbette](#).



Metron control plane for NFV service chains

A new ONOS control plane application for realizing high performance NFV service chains. [Tom Barbette](#) also contributed to this project.



Metron data plane for NFV service chains

A high performance NFV data plane with NIC offloading capabilities based on FastClick and the [DPDK Flow API](#). Joint work with [Tom Barbette](#).



Southbound Abstractions for Commodity Servers in ONOS

New southbound driver for monitoring and reconfiguring commodity server resources using the communication protocol described [here](#).



Contributions to DPDK 18.02 and 20.08

Modified DPDK's testpmd libraries to allow exploitation from external applications (joint work with [Tom Barbette](#)) and extended flow-perf tool.

Software Prototypes

Jun. 2018 [Managing Programmable NICs in Commodity Servers](#)

Presentation and demo at the Technical Steering Team (TST) of the Open Network Operating System ([ONOS](#)).

Apr. 2016 [Load-aware In-Network Failure Recovery driven by Stateful SDN Switches](#)

European Union Horizon 2020 BEBA Project.

Dec. 2013 [A Unified Framework for QoS and SLA-aware Multi-domain Self-Management](#)

European Union 7th Framework Programme UniverSelf Project.

Jul. 2012 [CONSERN Concepts in Action: Cooperative Power Control in WiFi Networks](#)

European Union 7th Framework Programme CONSERN Project.

Mar. 2012 [A Governance Framework for Heterogeneous Future Networks](#)

European Union 7th Framework Programme UniverSelf Project.

Feb. 2011 [Testing End-to-End Self-Management in a Wireless Future Internet Environment](#)

European Union 7th Framework Programme Self-NET & PII Projects.



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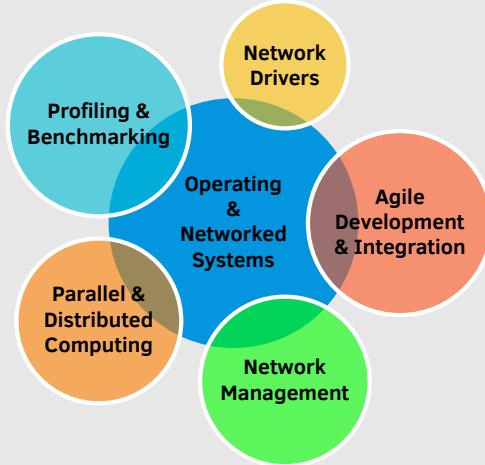


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Teaching

- 2015 - 2018 **M.Sc. Software Defined Networking and Network Functions Virtualization**
KTH Royal Institute of Technology,
School of Electrical Engineering and Computer Science,
Department of Communication Systems.
- 2016 - 2017 **M.Sc. Advanced Internetworking II**
KTH Royal Institute of Technology,
School of Information and Communication Technology,
Department of Communication Systems.
- 2015 - 2017 **M.Sc. Communication System Design**
KTH Royal Institute of Technology,
School of Information and Communication Technology,
Department of Communication Systems.
- 2014 - 2015 **M.Sc. Advanced Internetworking I**
KTH Royal Institute of Technology,
School of Information and Communication Technology,
Department of Communication Systems.
- 2011 - 2013 **B.Sc. Software Development for Telecommunications**
National and Kapodistrian University of Athens,
School of Science,
Department of Informatics and Telecommunications.
- 2011 - 2012 **B.Sc. Communication Networks Laboratory**
National and Kapodistrian University of Athens,
School of Science,
Department of Informatics and Telecommunications.
- 2010 - 2012 **B.Sc. Introduction to Computer Science**
National and Kapodistrian University of Athens,
School of Philosophy,
Department of Theatre Studies.

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- Linux • C • C++ • Java • Python
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