Savvas Savvides

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Research Interests

My research interests span the areas of information security and cloud computing with an emphasis on secure and efficient distributed computations. My recent projects revolve around using trusted execution environments and homomorphic encryption to enable efficient privacy-preserving analytics in untrusted clouds.

Positions

Adjunct Researcher 09/2020 - Present
Software Systems (SWYSTEMS), Università della Svizzera italiana, Lugano, Switzerland

Software Engineer 09/2020 - Present
Fortanix, Mountain View, CA, USA
Working on next-generation cloud computing security.

Software Engineer Intern 08/2019 - 12/2019
Oasis Labs, San Francisco, CA, USA
Off-chain compute services in the Oasis Labs blockchain network using Intel SGX.

Security Research Engineer Intern 05/2018 - 08/2018
Fortanix, Mountain View, CA, USA
Developed a secure consensus algorithm based on the Raft protocol using Intel SGX.

Research Summer Intern 06/2015 - 09/2015
IBM T. J. Watson Research Center, New York, USA
Research on estimating the execution-time of Apache Spark applications.

Graduate Teaching Assistant, CS180, CS252 Fall'13, Fall'14, Fall'18
Purdue University, West Lafayette, IN, USA
Assisted in teaching "Object-Oriented Programming" and "Systems Programming".

Graduate Teaching Assistant, CSUA.002 Spring'12, Fall'12
New York University, New York City, NY, USA
Assisted in teaching the course "Introduction to programming with Python"

Information Technology Intern 06/2010 - 08/2010
Cyprus Telecommunications Authority (CYTA), Nicosia, Cyprus
Developed data management tools using VBA.

IT Advisory Intern 06/2009 - 08/2009
KPMG, Nicosia, Cyprus
Performed penetration testing and vulnerability assessment on client companies.

Signal Corps Second Lieutenant 06/2006 - 07/2008
Cypriot National Guard, Nicosia, Cyprus

Education

Ph.D. in Computer Science, Purdue University, West Lafayette, IN, USA 08/2020
Thesis: *Practical Confidentiality-Preserving Data Analytics in Untrusted Clouds*
Advisor: Patrick Eugster

M.S. in Computer Science, New York University, New York City, NY, USA 06/2013
Thesis: *Analyzing System Call API behavior on different POSIX platforms*
Advisor: Justin Cappos

B.S. in Computer Science, University of Manchester, Manchester, UK 06/2011
Advisor: Howard Barringer

Awards, Fellowships, and Honors

Oasis Labs Fellowship 2019
Oasis Labs

A. G. Leventis Scholarship 2013 - 2014
A. G. Leventis Foundation

"24 Hours of Good, New York Hackathon", first place 2012
Google

Fulbright Scholarship 2011 - 2013
Fulbright - Institute of International Education

T.I.P. Grant 2011 - 2013
Graduate School of Arts and Science, New York University

Kilburn Final Year Performance Award 2011
University of Manchester

Kilburn Scholarship 2008 - 2011
University of Manchester

Cyprus State Scholarship 2008 - 2011
Republic of Cyprus

14th National Olympiad in Informatics, fourth place 2006
Cyprus Computer Society

Publications

Journal Articles

[J1] S. Savvides, S. Kumar, J. Stephen, and P. Eugster. C3PO: Cloud-based Confidentiality-preserving Continuous Query Processing. *ACM Transactions on Privacy and Security (TOPS)*, June 2021.

Magazine Articles

[M1] P. Eugster, S. Kumar, S. Savvides, J. Stephen. Ensuring Confidentiality in the Cloud of Things. *IEEE Pervasive Computing – Special Issue - IoT Communication*, Jan/Mar 2019

Articles in Conference Main Research Tracks

[C6] S. Savvides, D. Khandelwal, and P. Eugster. Efficient Confidentiality-Preserving Data Analytics over Symmetrically Encrypted Datasets. In *45th International Conference on Very Large Data Bases 2020 (VLDB'20)*, September 2020.

[C5] D. Ulybyshev, A. Alsalem, B. Bhargava, S. Savvides, G. Mani, and L. Ben-Othmane. Secure data communication in autonomous v2x systems. In *3rd IEEE International Congress on Internet of Things 2018 (ICIOT'18)*, July 2018.

[C4] S. Savvides, J. Stephen, M. Ardekani, V. Sundaram, P. Eugster. Secure Data Types: A Simple Abstraction for Confidentiality-Preserving Data Analytics. In *8th ACM Symposium on Cloud Computing 2017 (SoCC'17)*, September 2017.

[C3] M. Hauck, S. Savvides, P. Eugster, M. Mezini and G. Salvaneschi. SecureScala: Scala embedding of secure computations. In *7th ACM Scala Symposium 2016 (SCALA'16)*, Octomber 2016.

[C2] J. Stephen, S. Savvides, V. Sundaram, M. Ardekani and P. Eugster. STYX: Stream Processing with Trustworthy Cloud-based Execution. In *7th ACM Symposium on Cloud Computing 2016 (SoCC'16)*, September 2016.

[C1] J. Stephen, S. Savvides, R. Seidel and P. Eugster. Program Analysis for Secure Big Data Processing. In *29th IEEE/ACM International Conference on Automated Software Engineering (ASE'14)*, September 2014.

Workshop Papers in Proceedings

[W1] J. Stephen, S. Savvides, R. Seidel and P, Eugster. Practical Confidentiality Preserving Big Data Analysis. In *USENIX Workshop on Hot Topics in Cloud Computing 2014 (HotCloud'14)*, June 2014.

Patents

[P1] J. Beekman, S. Savvides, R. Searle, A. Kumar. Confidential Computing Workflows. *US Patent LS Docket No.: 33092.21 (L0021)*, 2021.

Theses Articles

[T2] S. Savvides. Practical Confidentiality Preserving Data Analytics in Untrusted Clouds. Ph.D. Thesis, Purdue University, Aug 2020.

[T1] S. Savvides. Parsing and Analyzing POSIX API behavior on different platforms. Master's Thesis, New York University, Aug 2013.

Funding and Grants

Accepted

[G4] Symmetric Homomorphic Encryption for Low-Latency Privacy-Preserving Data Processing
Cisco Systems Inc., Cisco Research Grant

Duration of Funding:	08/2021 - 08/2022
Total Amount of Award:	$100,000
Role:	Co-PI (PI: Patrick Eugster)
Percentage of funding responsible:	–

[G3] Efficient Confidentiality-Preserving Data Analytics over Symmetrically Encrypted Datasets
AWS Cloud Credits Award for Research

Duration of Funding:	07/2019 - 07/2020
Total Amount of Award:	$50,000
Role:	Co-PI (PI: Patrick Eugster)
Percentage of funding responsible:	10%

[G2] A Methodological Approach to Privacy-Preserving Computation
Hasler foundation, Switzerland

Duration of Funding:	3/2020 - 2/2021
Total Amount of Award:	50,000 CHF
Role:	Co-PI (PI: Patrick Eugster)
Percentage of funding responsible:	–

[G1] Secure Data Types: A Simple Abstraction for Confidentiality-Preserving Data Analytics
AWS Cloud Credits Award for Student Researchers

Duration of Funding:	07/2017 - 07/2018
Total Amount of Award:	$5,000
Role:	PI
Percentage of funding responsible:	100%

Under Evaluation

[G3] Symmetric Homomorphic Encryption for Real-Time Privacy-Preserving Data Processing
NGI Assure

Duration of Funding:	2021 - 2022
Total Amount of Award:	$98,159.08
Role:	Co-PI (PI: Patrick Eugster)
Percentage of funding responsible:	–

[G2] A Methodological Approach to Privacy-Preserving Data Analysis Pipelines
Facebook, Privacy Enhancing Technologies Call

Duration of Funding:	2021 - 2022
Total Amount of Award:	$100,000
Role:	Co-PI (PI: Patrick Eugster)
Percentage of funding responsible:	–

[G1] Symmetric Homomorphic Encryption for Fast Privacy Preserving Data Analysis
Facebook, Privacy Enhancing Technologies Call

Duration of Funding:	2021 - 2022
Total Amount of Award:	$100,000
Role:	Co-PI (PI: Patrick Eugster)
Percentage of funding responsible:	–

Advising

Current Students

1. Shamiek Mangipudi, Ph.D. student in Computer Science, USI Università della Svizzera italiana, Research Assistant. "A Hybrid Approach to Confidentiality-Preserving Data Analytics". Co-advised with P. Eugster.

Graduated Students

1. Darshika Khandelwal, USI Università della Svizzera italiana, Graduate Research Assistant. "Evaluating privacy-preserving TPC-H Queries on Apache Spark". Mar 2019 - Sep 2019. Co-advised with P. Eugster. Now Software Engineer at Productiv.

Academic Service

External Reviewer

1. ACM/IFIP/USENIX International Middleware Conference (Middleware 2019)
2. International Conference on Formal Techniques for Distributed Objects, Components, and Systems (FORTE 2019)
3. ACM/IFIP/USENIX International Middleware Conference (Middleware 2018)
4. ACM International Conference on Distributed and Event-based Systems (DEBS 2018)
5. International Conference on Principles of Distributed Systems (OPODIS 2017)
6. European Conference on Object-Oriented Programming (ECOOP 2017)
7. ACM/IEEE International Conference on Software Engineering (ICSE 2017)
8. ACM Conference on Object-Oriented Programming, Systems, Languages, and Applications (OOPSLA 2016)
9. IEEE International Conference on Distributed Computing Systems (ICDCS 2014)

Departmental Service

1. Travel Grant Chair, Graduate Student Board, Purdue University (2017-2018)
2. Webmaster, Graduate Student Board, Purdue University (2017-2018)