Georgios Papadimitriou

EDUCATION

University of Southern California (USC)	December 2023
Ph.D. in Computer Science, applied GPA 3.78/4.0	Los Angeles, CA
University of Southern California (USC)	May 2023
M.Sc. in Computer Science, applied GPA 3.78/4.0	Los Angeles, CA
National Technical University of Athens (NTUA)	August 2017
B.Sc. in Electrical and Computer Engineering, GPA 8.06/10.0	Athens, Greece

RESEARCH INTERESTS

My interests lie within the intersection of Distributed Computing and Data Intensive Applications.
This includes concepts manifesting in High Performance Computing, Cloud Computing and Big Data systems.
I'm particularly interested in how applications can share resources efficiently among them and the analysis of large
systems based on measurements.

EXPERIENCE

Graduate Research Assistant – Information Sciences Institute, USC	Aug. 2017 - Present
Member of the SciTech group, working on performance collection and analysis of workflows.	Los Angeles, CA
Summer Intern – TikTok, Bytedance	May 2022 - Aug. 2022
Monetization Data Technology. Worked on Ad measurements and pipelines to support conversion lift studies.	Mountain View, CA
Teaching Assistant – University of Southern California (USC)	Aug. 2021 - May 2022
Teaching assistant for CSCI 350 - Introduction to Operating Systems	Los Angeles, CA
Summer Intern (ASTRO) – Oak Ridge National Laboratory (ORNL)	June 2018 - Aug. 2018
Worked with ORNL scientists to develop novel science workflows. Mentored by Jeff Vetter.	Oak Ridge, TN
Full Stack Junior Software Engineer – Cententia S.A	Oct. 2014 - Oct. 2016
Developer of the MIS Report and Data Integration Modules for the AroTRON eCRM.	Athens, Greece

AWARDS

Best Paper Award – Cloud2Things 2022	May 2022
FGCS Journal 2021 Best Paper Award – Future Generation Computer Technologies	October 2021
Best Student Paper – PEARC'20 Conference	July 2020
Gerondelis Foundation Scholarship – Gerondelis Foundation	October 2019
ISI Distinguished Top-Off Fellowship – Information Sciences Institute	August 2017

NOTABLE USC GRADUATE COURSEWORK

Machine Learning (CSCI 567), taught by prof. Yan Liu	Spring 2020
Advanced Analysis of Algorithms (CSCI 670), taught by prof. Ming-Deh Huang	Spring 2019
Advanced Operating Systems (CSCI 555), taught by prof. Ramesh Govindan	Fall 2018
Advanced Computer Networking (CSCI 651), taught by prof. John Heidemann	Spring 2018
Advanced Topics in Databases (CSCI 685), taugh by prof. Shahram Ghandeharizadeh	Spring 2018

NOTABLE SOFTWARE ENGINEERING PROJECTS

Dynamic Network-Centric Platform	Python, AMQP, Prometheus, Chameleon Cloud	Fall 2020
Built a platform for provisioning compute and network cloud resources for scientific workflow ensembles.	
Panorama360 Data Collection Architecture	C, Python, Bash, AMQP, ELK Stack	Fall 2018
Built an online monitoring architecture for scientific workflows executed using Pegasus WMS.	
JOS Operating System	C, QEMU	Fall 2018
Built a simple operating system called JOS that was based on an exokernel approach.	
Evaluating Oracle's NoSQL Database	Python, Java, NoSQL	Fall 2017
Evaluated Oracle's Sharding and JSON capabilities using the YCSB and NoBench benchmarks.	

Undergraduate Thesis | Apache Hadoop, Apache Spark, Apache HBase, Docker   Sping 2017
Anomaly detection on compute resources using robust statistical methods.

Type Inference System | Haskell, Shell Scripting   Fall 2014
Implementation of a type inference system for the simply typed lambda calculus.

TECHNICAL SKILLS

Programming Languages:	C/C++, C#, Python, Java, Haskell, Scala, Bash Scripting, SQL
Databases Systems:	SQL (MySQL, SQL Server), NoSQL (HBase, MongoDB, Elasticsearch), Hive
Frameworks:	Apache Spark, Apache Hadoop, Kubernetes, Pegasus WMS, HTCondor, RabbitMQ
Tools & Libraries:	Git, LaTeX, NVML, Slurm, Docker, Apptainer

PUBLICATIONS

[1] Andrew Grote, Eric Lyons, Komal Thareja, **George Papadimitriou**, Ewa Deelman, Anirban Mandal, Prasad Calyam, and Michael Zink. "FlyPaw: Optimized Route Planning for Scientific UAVMissions". In: *2023 IEEE 19th International Conference on e-Science (e-Science)*. Funding Acknowledgments: NSF 2018074, 1939334. 2023, pp. 1–10. DOI: 10.1109/e-Science58273.2023.10254831.

[2] Hongwei Jin, Krishnan Raghavan, **George Papadimitriou**, Cong Wang, Anirban Mandal, Mariam Kiran, Ewa Deelman, and Prasanna Balaprakash. "Graph neural networks for detecting anomalies in scientific workflows". In: *The International Journal of High Performance Computing Applications* (2023). Funding Acknowledgments: DOE DE-SC0022328, DE-AC02-06CH11357. DOI: 10.1177/10943420231172140. eprint: https://doi.org/10.1177/10943420231172140. URL: https://doi.org/10.1177/10943420231172140.

[3] Imtiaz Mahmud, **George Papadimitriou**, Cong Wang, Mariam Kiran, Anirban Mandal, and Ewa Deelman. "Elephants Sharing the Highway – Studying TCP Fairness in Large Transfers Over High Throughput Links". In: *2023 IEEE/ACM Innovating the Network for Data-Intensive Science (INDIS)*. Funding Acknowledgments: DOE DE-SC0022328. 2023.

[4] Alicia Esquivel Morel, Prasad Calyam, Chengyi Qu, Durbek Gafurov, Cong Wang, Komal Thareja, Anirban Mandal, Eric Lyons, Michael Zink, **George Papadimitriou**, and Ewa Deelman. "Network Services Management using Programmable Data Planes for Visual Cloud Computing". In: *2023 International Conference on Computing, Networking and Communications (ICNC)*. Funding Acknowledgments: NSF 1950873, 2018074. 2023, pp. 130–136. DOI: 10.1109/ICNC57223.2023.10074183.

[5] Alicia Esquivel Morel, Durbek Gafurov, Prasad Calyam, Cong Wang, Komal Thareja, Anirban Mandal, Eric Lyons, Michael Zink, **George Papadimitriou**, and Ewa Deelman. "Experiments on Network Services for Video Transmission using FABRIC Instrument Resources". In: *IEEE INFOCOM 2023 - IEEE Conference on Computer Communications Workshops (INFOCOM WKSHPS)*. Funding Acknowledgments: NSF 1950873, 1647182, 2018074. 2023, pp. 1–6. DOI: 10.1109/INFOCOMWKSHPS57453.2023.10225817.

[6] Alicia Esquivel Morel, Chengyi Qu, Prasad Calyam, Cong Wang, Komal Thareja, Anirban Mandal, Eric Lyons, Michael Zink, **George Papadimitriou**, and Ewa Deelman. "FlyNet: Drones on the Horizon". In: *IEEE Internet Computing* 27.3 (2023). Funding Acknowledgments: NSF 1950873, 1647182, 2018074, pp. 35–43. DOI: 10.1109/MIC.2023.3260440.

[7] **George Papadimitriou**, Hongwei Jin, Cong Wang, Krishnan Raghavan, Anirban Mandal, Prasanna Balaprakash, and Ewa Deelman. *Flow-Bench: A Dataset for Computational Workflow Anomaly Detection*. 2023. DOI: 10.48550/ARXIV.2306.09930. URL: https://arxiv.org/abs/2306.09930.

[8] **George Papadimitriou**, Cong Wang, Eric Lyons, Komal Thareja, Paul Ruth, J. J. Villalobos, Ivan Rodero, Ewa Deelman, Michael Zink, and Anirban Mandal. "Dynamic Network-Centric Multi-cloud Platform for Real-Time and Data-Intensive Science Workflows". In: *Handbook of Dynamic Data Driven Applications Systems: Volume 2*. Ed. by Frederica Darema, Erik P. Blasch, Sai Ravela, and Alex J. Aved. Funding Acknowledgments: NSF 1826997. Cham: Springer International Publishing, 2023, pp. 835–868. ISBN: 978-3-031-27986-7. DOI: 10.1007/978-3-031-27986-7_32. URL: https://doi.org/10.1007/978-3-031-27986-7_32.

[9] Hongwei Jin, Krishnan Raghavan, **George Papadimitriou**, Cong Wang, Anirban Mandal, Patrycja Krawczuk, Loïc Pottier, Mariam Kiran, Ewa Deelman, and Prasanna Balaprakash. "Workflow Anomaly Detection with Graph Neural Networks". In: *2022 IEEE/ACM Workshop on Workflows in Support of Large-Scale Science (WORKS)*. Funding Acknowledgments: DOE DE-SC0022328, DE-AC02-06CH11357. 2022, pp. 35–42. DOI: 10.1109/WORKS56498.2022.00010.

[10] Ryan Tanaka, **George Papadimitriou**, Sai Charan Viswanath, Cong Wang, Eric Lyons, Komal Thareja, Chengyi Qu, Alicia Esquivel, Ewa Deelman, Anirban Mandal, Prasad Calyam, and Michael Zink. "Automating Edge-to-cloud Workflows for Science: Traversing the Edge-to-cloud Continuum with Pegasus". In: *2022 22nd IEEE International Symposium on Cluster, Cloud and Internet Computing (CCGrid)*. Funding Acknowledgments: NSF 2018074, 1664162. 2022, pp. 826–833. DOI: 10.1109/CCGrid54584.2022.00098.

[11] Henri Casanova, Ewa Deelman, Sandra Gesing, Michael Hildreth, Stephen Hudson, William Koch, Jeffrey Larson, Mary Ann McDowell, Natalie Meyers, John-Luke Navarro, **George Papadimitriou**, Ryan Tanaka, Ian Taylor, Douglas Thain, Stefan M. Wild, Rosa Filgueira, and Rafael Ferreira da Silva. "Emerging Frameworks for Advancing Scientific Workflows Research, Development, and Education". In: *2021 IEEE Workshop on Workflows in Support of Large-Scale Science (WORKS)*. Funding Acknowledgments: DOE DE-SC0012636, NSF 1664162. 2021, pp. 74–80. DOI: 10.1109/WORKS54523.2021.00015.

[12] Patrycja Krawczuk, **George Papadimitriou**, Shubham Nagarkar, Mariam Kiran, Anirban Mandal, and Ewa Deelman. "Anomaly Detection in Scientific Workflows using End-to-End Execution Gantt Charts and Convolutional Neural Networks". In: *Proceedings of the Practice and Experience in Advanced Research Computing*. PEARC '21. Funding Acknowledgments: DOE DESC0012636. Boston, MA, USA: Association for Computing Machinery, 2021. ISBN: 978-1-4503-8292-2. DOI: 10.1145/3437359.3465597. URL: http://doi.acm.org/10.1145/3437359.3465597.

[13] Patrycja Krawczuk, **George Papadimitriou**, Ryan Tanaka, Tu Mai Anh Do, Srujana Subramany, Shubham Nagarkar, Aditi Jain, Kelsie Lam, Anirban Mandal, Loïc Pottier, and Ewa Deelman. "A Performance Characterization of Scientific Machine Learning Workflows". In: *2021 IEEE/ACM Workflows in Support of Large-Scale Science (WORKS)*. Funding Acknowledgments: DOE DE-SC0012636, NSF 1664162. 2021. DOI: 10.1109/WORKS54523.2021.00013.

[14] Eric Lyons, Hakan Saplakoglu, Michael Zink, Komal Thareja, Anirban Mandal, Chengyi Qu, Songjie Wang, Prasad Calyam, **George Papadimitriou**, Ryan Tanaka, and Ewa Deelman. "FlyNet: A Platform to Support Scientific Workflows from the Edge to the Core for UAV Applications". In: *Proceedings of the 14th IEEE/ACM International Conference on Utility and Cloud Computing*. UCC '21. Funding Acknowledgements: NSF 2018074. Leicester, United Kingdom: Association for Computing Machinery, 2021. ISBN: 9781450385640. DOI: 10.1145/3468737.3494098. URL: https://doi.org/10.1145/3468737.3494098.

[15] Eric Lyons, Dong-Jun Seo, Sunghee Kim, Hamideh Habibi, **George Papadimitriou**, Ryan Tanaka, Ewa Deelman, Michael Zink, and Anirban Mandal. "Predicting Flash Floods in the Dallas-Fort Worth Metroplex Using Workflows and Cloud Computing". In: *2021 IEEE 17th International Conference on eScience (eScience)*. Funding Acknowledgments: NSF 1826997, 2018074, 1664162. 2021, pp. 259–261. DOI: 10.1109/eScience51609.2021.00050.

[16] **George Papadimitriou** and Ewa Deelman. "A Lightweight GPU Monitoring Extension for Pegasus Kickstart". In: *2021 IEEE/ACM Workflows in Support of Large-Scale Science (WORKS)*. Funding Acknowledgments: DOE DE-SC0012636, NSF 1664162. 2021.

[17] **George Papadimitriou**, Eric Lyons, Cong Wang, Komal Thareja, Ryan Tanaka, Paul Ruth, Ivan Rodero, Ewa Deelman, Michael Zink, and Anirban Mandal. "Fair sharing of network resources among workflow ensembles". In: *Cluster Computing* (2021). Funding Acknowledgments: NSF 1826997. ISSN: 1573-7543. DOI: 10.1007/s10586-021-03457-3. URL: https://doi.org/10.1007/s10586-021-03457-3.

[18] **George Papadimitriou**, Cong Wang, Karan Vahi, Rafael Ferreira da Silva, Anirban Mandal, Liu Zhengchun, Rajiv Mayani, Mats Rynge, Mariam Kiran, Vickie E. Lynch, Rajkumar Kettimuthu, Ewa Deelman, Jeffrey S. Vetter, and Ian Foster. "End-to-End Online Performance Data Capture and Analysis for Scientific Workflows". In: *Future Generation Computer Systems* 117 (2021). Funding Acknowledgments: DOE DE-SC0012636, pp. 387–400. ISSN: 0167-739X. DOI: https://doi.org/10.1016/j.future.2020.11.024. URL: http://www.sciencedirect.com/science/article/pii/S0167739X20330570.

[19] Huy Tu, **George Papadimitriou**, Mariam Kiran, Cong Wang, Anirban Mandal, Ewa Deelman, and Tim Menzies. "Mining Workflows for Anomalous Data Transfers". In: *2021 2021 IEEE/ACM 18th International Conference on Mining Software Repositories (MSR) (MSR)*. Funding Acknowledgmentt: NSF 1826574, NSF 1931425, DOE DE-SC0012636. Los Alamitos, CA, USA: IEEE Computer Society, May 2021, pp. 1–12. DOI: 10.1109/MSR52588.2021.00013. URL: https://doi.ieeecomputersociety.org/10.1109/MSR52588.2021.00013.

[20] Mariam Kiran, Cong Wang, **George Papadimitriou**, Anirban Mandal, and Ewa Deelman. "Detecting Anomalous Packets in Network Transfers: Investigations using PCA, Autoencoder and Isolation Forest in TCP". In: *Machine Learning* (2020). Funding Acknowledgments: DOE DESC0012636. ISSN: 1573-0565. DOI: 10.1007/s10994-020-05870-y. URL: https://doi.org/10.1007/s10994-020-05870-y.

[21] Eric Lyons, David Westbrook, Andrew Grote, **George Papadimitriou**, Komal Thareja, Cong Wang, Michael Zink, Ewa Deelman, Anirban Mandal, and Paul Ruth. "An On-Demand Weather Avoidance System for Small Aircraft Flight Path Routing". In: *Dynamic Data Driven Application Systems*. Ed. by Frederica Darema, Erik Blasch, Sai Ravela, and Alex Aved. Funding Acknowledgments: NSF 1826997, 2018074. Cham: Springer International Publishing, 2020, pp. 311–319. ISBN: 978-3-030-61725-7. DOI: 10.1007/978-3-030-61725-7_36.

[22] Eric Lyons, Michael Zink, Anirban Mandal, Cong Wang, Paul Ruth, Chandrasekar Radhakrishnan, **George Papadimitriou**, Ewa Deelman, Komal Thareja, and Ivan Rodero. "DyNamo: Scalable Weather Workflow Processing in the Academic MultiCloud". In: *100th American Meteorological Society Annual Meeting* (2020). Funding Acknowledgments: NSF 1826997.

[23] **George Papadimitriou**, Eric Lyons, Cong Wang, Komal Thareja, Ryan Tanaka, Paul Ruth, J.J. Villalobos, Ivan Rodero, Ewa Deelman, Michael Zink, and Anirban Mandal. "Application Aware Software Defined Flows of Workflow Ensembles". In: *2020 IEEE/ACM Innovating the Network for Data-Intensive Science (INDIS)*. Funding Acknowledgments: NSF 1826997. 2020, pp. 10–21. DOI: 10.1109/INDIS51933.2020.00007.

[24] **George Papadimitriou**, Karan Vahi, Jason Kincl, Valentine Anantharaj, Ewa Deelman, and Jack Wells. "Workflow Submit Nodes as a Service on Leadership Class Systems". In: *Proceedings of the Practice and Experience in Advanced Research Computing*. PEARC '20. Funding Acknowledgments: DOE DESC0012636. Portland, OR, USA: Association for Computing Machinery, 2020. ISBN: 978-1-4503-6689-2. DOI: 10.1145/3311790. 3396671. URL: http://doi.acm.org/10.1145/3311790.3396671.

[25] K. Vahi, D. Goldstein, **G. Papadimitriou**, P. Nugent, and E. Deelman. "Gearing the DECam Analysis Pipeline for Multi-Messenger Astronomy Using Pegasus Workflows". In: *Astronomical Data Analysis Software and Systems XXIX*. Ed. by R. Pizzo, E. R. Deul, J. D. Mol, J. de Plaa, and H. Verkouter. Vol. 527. Astronomical Society of the Pacific Conference Series. Funding Acknowledgments: NSF 1664162, DOE DESC0012636. Jan. 2020, p. 631.

[26] Cong Wang, **George Papadimitriou**, Mariam Kiran, Anirban Mandal, and Ewa Deelman. "Identifying Execution Anomalies for Data Intensive Workflows Using Lightweight ML Techniques". In: *2020 IEEE High Performance extreme Computing Conference (HPEC)*. Funding Acknowledgments: DOE DESC0012636. 2020, pp. 1–7. DOI: 10.1109/HPEC43674.2020.9286139.

[27] Ewa Deelman, Karan Vahi, Mats Rynge, Rajiv Mayani, Rafael Ferreira da Silva, **George Papadimitriou**, and Miron Livny. "The Evolution of the Pegasus Workflow Management Software". In: *Computing in Science Engineering* 21.4 (2019). Funding Acknowledgments: NSF 1664162, NSF 1148515, DOE DESC0012636, NSF 1642053, pp. 22–36. DOI: 10.1109/MCSE.2019.2919690.

[28] Rafael Ferreira da Silva, Scott Callaghan, Tu Mai Anh Do, **George Papadimitriou**, and Ewa Deelman. "Measuring the Impact of Burst Buffers on Data-Intensive Scientific Workflows". In: *Future Generation Computer Systems* 101 (2019). Funding Acknowledgments: DOE DESC0012636, NSF 1664162, NSF 1741040, pp. 208–220. DOI: 10.1016/j.future.2019.06.016.

[29] Eric Lyons, **George Papadimitriou**, Cong Wang, Komal Thareja, Paul Ruth, J.J. Villalobos, Ivan Rodero, Ewa Deelman, Michael Zink, and Anirban Mandal. "Toward a Dynamic Network-centric Distributed Cloud Platform for Scientific Workflows: A Case Study for Adaptive Weather Sensing". In: *15th International Conference on eScience (eScience)*. Funding Acknowledgments: NSF 1826997. San Diego, CA, USA, 2019, pp. 67–76. DOI: 10.1109/eScience.2019.00015.

[30] **George Papadimitriou**, Mariam Kiran, Cong Wang, Anirban Mandal, and Ewa Deelman. "Training Classifiers to Identify TCP Signatures inScientific Workflows". In: *2019 IEEE/ACM Innovating the Network for Data-Intensive Science (INDIS)*. Funding Acknowledgments: DOE DESC0012636. Denver, CO, USA, 2019, pp. 61–68. DOI: 10.1109/INDIS49552.2019.00012.

[31] Ivan Rodero, Yubo Qin, Jesus Valls, Anthony Simonet, J.J. Villalobos, Manish Parashar, Chooban Youn, Cong Wang, Komal Thareja, Paul Ruth, **George Papadimitriou**, Eric Lyons, and Michael Zink. "Enabling Data Streaming-based Science Gateway through Federated Cyberinfrastructure". In: *Gateways 2019*. Funding Acknowledgments: NSF 1835692, NSF 1745246, NSF 1826997. San Diego, CA, USA, 2019.

[32] Karan Vahi, Mats Rynge, **George Papadimitriou**, Duncan Brown, Rajiv Mayani, Rafael Ferreira da Silva, Ewa Deelman, Anirban Mandal, Eric Lyons, and Michael Zink. "Custom Execution Environments with Containers in Pegasus-enabled Scientific Workflows". In: *15th International Conference on eScience (eScience)*. Funding Acknowledgments: NSF 1664162, NSF 1826997, NSF 1443047. San Diego, CA, USA, 2019, pp. 281–290. DOI: 10.1109/eScience.2019.00039.