Athanasios Tsitsipas

Researcher at IOMI, University of Ulm

My background mainly consists variety of fields in distributed systems including cloud computing, heterogeneous environments and the programmability of those. I have participated in many European Projects in the topic of Cloud Computing and writing also many proposals for various ICT calls. My daily schedule consists mostly of research in the respective fields for the projects that I receive my funding and my PhD (which is considered a side task). However, from March 2019 I will start working in an accepted proposal that we submitted for funding from the German Federal Ministry of Education and Research. The project name is "HorME" (Horizontally scalable, Multipurpose execution Environment) and focuses on the development of a programming model that allows (de-)composition and declaration of complex tasks, while ensuring correctness of the result. The solution will be demonstrable within an Ambient Assisted Living usecase, which domain specific context will be implemented using as **a basis a solution that lends from category theory**.

My **PhD topic is about** *creating a programming model for contextual equivalence and compositionality of computable functions in decentralised and interconnected environments.* The motivation of the work lays on the fact that various different functions (e.g. sensors, events. operations etc.) are present and available in an environment without them primarily communicating or exchanging states or anything else. They are just a sum of "parts". However, we would like to bring them together as a "whole" and combine them in a sense that we can get indirectly the same information/function that another sensor provides us directly. The solution to tackle this **lends from category theory and more particular from group theory**, that we consider the functions as elements in groups that have an "operation" for composition and the result of the operation is definitely inside the group (the composition of functions will end up on a function in the group; the indirect vs the direct)). Through this, I would like to create a programming model that will give the opportunity to describe a domain but maintain correctness on the composition of the elements(functions). The solution might be too ambitious, but from my perspective could be tackled with an abstract layer lending from group theory.

The HorME project has parts of my PhD, thus a more focused work primarily for my research work lays ahead. I am already two years doing my PhD, but part time. Expected time for completion is 3-4 years. I would like to get the opportunity to present and discuss my idea for the solution of the problem. **The school will assist me** getting to know the concepts of category theory better and to exchange information with respected people in the field. As it is critical for my research work to **dive into applying concepts from category theory and extend my horizons.** I would like to be accepted as part of the project of ***David Spivak*** **with the title "*Towards a mathematical foundation for autopoiesis*".** These autopoietic organisations that are described in the project match the degree of adaptation that I would like to tackle also with my research work. The other projects are too mathematical for my research interests, however as a second preference is *Pieter Hofstra* with the *"Complexity classes, computation and Turing categories".*

With respect to availability of funding, **I can commit on joining** Oxford on expenses from my institute for both the summer school and then the ACT conference.

Athanasios Tsitsipas

Date of birth: 14/11/1988

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+49 1744037185

Work Experience

IOMI, University of Ulm
Feb. 2016 - present

PhD Candidate
Topic: *"A programming model for contextual equivalence and compositionality of computable functions in decentralised and interconnected environments."*

IOMI, University of Ulm
Nov. 2014 - present

Researcher
Participation in various European Projects such as CACTOS, CloudSocket, CloudPerfect, MELODIC

Altec Integration S.A
Okt. 2009-Nov. 2014:

Software Engineer
Development and supporting a number of complex large-scale projects with proper use and integration of multiple technologies for the private and public sector.

Education - Degrees

University of Piraeus

2014	Department of Digital Systems **Network-Oriented Systems**	Master's degree
2011	Department of Digital Systems **Telecommunications & Networks**	Bachelor's degree
2006	General Lyceum	Apolytirio

Publications

- Schubert, Lutz; Jeffery, Keith and Tsitsipas, Athanasios: **"Establishing a Basis for New Software Engineering Principles"**, Internet of Things, Volumes 3–4, 2018
- Tsitsipas, Athanasios: **"A Theoretical Concept: Towards Mathematical Declarations of Code Intentions"**, The 8th International Conference on Advanced Communications and Computation 2018
- Schubert, Lutz; Jeffery, Keith and Tsitsipas, Athanasios: **"How Cloud Computing, IoT and Multi-core systems affect software engineering principles"**, 32nd IEEE International Conference on Advanced Information Networking and Applications, 2018
- Krach, Sebastian; Stier, Christian and Tsitsipas, Athanasios: **"Modeling IaaS Usage Patterns for the Analysis of Cloud Optimization Policies"**, Symposium on Software Performance (SSP) 2016
- Hauser, Christopher B.; Tsitsipas, Athanasios and Domaschka, Jörg: **"Context-Aware Cloud**

Topology Optimization for OpenStack" Springer CCIS 2016

- Seybold, Daniel; Domaschka, Jörg; Rossini, Alessandro; Hauser, Christopher B.; Griesinger, Frank and Tsitsipas, Athanasios: **"Experiences of models@run-time with EMF and CDO**", ACM Digital Library, 2016
- Tsitsipas, Athanasios; Hauser, Christopher B.; Domaschka, Jörg and Wesner, Stefan: **"Towards Usage-based Dynamic Overbooking in IaaS Clouds"**, Proceedings of the 13th International Conference on Economics of Grids, Cloud, Systems and Services (GECON 2016)
- Baur, Daniel; Seybold, Daniel; Griesinger, Frank; Tsitsipas, Athanasios; Hauser, Christopher B. and Domaschka, Jörg: **"Cloud Orchestration Features: Are Tools Fit for Purpose?"**, IEEE 8th International Conference on Utility and Cloud Computing 2015
- Tsitsipas, Athanasios; Kyriazis, Dimosthenis and Themistocleous, Marinos: **"Real-time execution flow management for event-driven computational cloud storage"**, Online Proceedings of the European, Mediterranean & Middle Eastern Conference on Information Systems (EMCIS) 2014
- Qevani, Elton; Panagopoulou, Marianthi; Stampoltas, Christoforos; Tsitsipas, Athanasios; Kyriazis, Dimosthenis and Themistocleous, Marinos: **"What Can OpenStack Adopt from a Ganeti-Based Open-Source IaaS?"** IEEE 7th International on Cloud Computing (CLOUD) 2014

Languages

Greek

Native Language

English

Certificate of Proficiency Michigan University

German

Mittelstufe B1 Telc GmbH

Skills

General Skills

Software Engineering
Programming models
Cloud Computing
Distributed Systems
Algorithms
Applied Category theory

Development Skills

Programming Languages	**Java, Haskell, Racket**
Web Client Technologies	**JS, jQuery, HTML5, CSS3**
Databases	**Oracle, MySQL, InfluxDB**
IDE	**IntelliJ, Netbeans, Eclipse**
UI Frameworks	**GWT, Vaadin, Ansible**
Format Standards	**JSON, XML, YAML**
Application Servers	**Glassfish, Apache, NGINX**
Containers & Orcherstration	**Docker, Kubernetes, Swarm, Rancher**
Cloud Software	**OpenStack**

Gmail

Applied Category Theory <act2019school@gmail.com>

Recommendation for Athanasios Tsitsipas, ACT2019 School

1 message

Lutz <lutz.schubert@uni-ulm.de>
To: act2019school@gmail.com
Cc: athanasios.tsitsipas@uni-ulm.de

Wed, Jan 30, 2019 at 9:33 AM

Dear Ladies and Gentlemen,

I hope this email finds you well - I write to you in my function as main supervisor for Mr. Athanasios Tsitsipas who applied to participate in the ACT2019 School. Our institute focuses on programming and execution of applications in highly dynamic and heterogeneous infrastructures, which requires a high degree of adaptation from the software. Mr. Tsitsipas work focuses specifically on how such applications can be described using a mathematical abstraction lending from group theory. He has just started to work on the topic and the exchange with other researchers from the area of category theory will surely greatly benefit his PhD work. The basis of his thesis is that mathematical representations of computational tasks can be used for combination, transformation and decomposition according to the mathematical body they belong to – this is obviously highly ambitious and will have to investigate the constraints and applicability of group theory carefully, to which this school and in particular the presentations by David Spivak and Pieter Hofstra will be highly beneficial. Mr. Tsitsipas has already exchanged first ideas with Dr. Jan Kuper from University of Twente and contributed to the POLCA project, which was centered around transformation and dynamic adaptation of large scale algorithms.

In addition to this, the information gathered from the school will be of high interest to our institute in general, given the overall research topic here.

I hereby also confirm that the institute will cover all necessary expenses for Mr. Tsitsipas joining the conference and school in Oxford.

Should any questions remain, please do not hesitate to contact me.

With best regards

Lutz Schubert

(Deputy Director of the Institute of Information Resource Management, University of Ulm)