

# Filip Marković

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**GitHub:** <https://github.com/Aeoliphile>

**Phone:** (+46) 762860977

**Citizenship:** Montenegro (and Swedish permanent residency)

**Research interests** Computer science, Cyber-physical systems, Real-time computing, Probability theory and statistics, Stochastic processes, Real-time operating systems

**Education** **PhD in Computer Science** August 2015 – June 2020  
**Mälardalen University (MDU)** Västerås, Sweden

**School of Innovation, Design and Technology (IDT)**  
**Division of Computer Science and Engineering (CSE)**  
Mentors: *Prof.* Jan Carlson, *Assoc.Prof.* Radu Dobrin, and *Prof.* Björn Lisper.  
Thesis: *Preemption-Delay Aware Schedulability Analysis of Real-Time Systems*

**Licentiate in Computer Science** August 2015 – September 2018  
**Mälardalen University (MDU)** Västerås, Sweden

**School of Innovation, Design and Technology (IDT)**  
**Division of Computer Science and Engineering (CSE)**  
Mentors: *Prof.* Jan Carlson, *Assoc.Prof.* Radu Dobrin, and *Prof.* Björn Lisper.  
Thesis: *Improving the Schedulability of Real Time Systems under Fixed Preemption Point Scheduling*

**MSc in Computer Science** August 2014 – June 2015  
**Mälardalen University (MDU)** Västerås, Sweden

**School of Innovation, Design and Technology (IDT)**  
**Division of Computer Science and Engineering (CSE)**  
Mentors: *Assist.Prof.* Adnan Čaušević and *Assist.Prof.* Eduard Paul Enoiu  
Thesis: *Automated test generation for structured text language using UPPAAL model checker*

**Specialist in Information Technologies** September 2013 – August 2014

**BSc in Information Technologies** September 2010 – July 2013  
**Mediterranean University,** Podgorica, Montenegro  
**Faculty for Information Technologies**

**Honors and** Best presentation award (IEEE Real-Time Systems Symposium (RTSS)) 2022  
Outstanding paper award (ECRTS technical committee) 2021

**scholarships** PhD scholarship (Erasmus Mundus+, European Commission) 2015 – 2018  
MSc scholarship (Erasmus Mundus, European Commission) 2014 – 2015

## Research experience

### **Postdoc position, Max Planck Institute for Software Systems**

Real-Time Systems Group

July 2022 – Present

Working as a postdoc researcher on the project named *A Theory-Oriented Real-Time Operating System for Temporally Sound Cyber-Physical Systems* (TOROS). For more info click [here](#).

### **Postdoc position, Division of Networked and Embedded Systems (NES)**

MDU – IDT – NES

August 2020 – Present

Working as a postdoc researcher on the project named *Practical Probabilistic Timing Analysis of Real-Time Systems* (PARIS). For more info click [here](#).

### **PhD position, Division of Computer Science and Software Engineering**

MDU – IDT – CSE

August 2015 – 2020

Worked as a PhD researcher in the area of real-time scheduling and cache-aware timing analysis. The emphasis of this research was to analyse computing systems where a task code may be instrumented to allow (or not) for task interruptions at specified points of the task's execution.

## Teaching experience

### **Teaching assistant for the following courses given at MDU – IDT – CSE**

#### **Component-based technologies**

Fall 2018–2019

My responsibilities: *Lab design and evaluation of practical work where students were supposed to create a software system consisting of modules implemented in different programming languages.*

#### **Software Architecture**

Spring 2018–2022

My responsibilities: *Lab design and evaluation of practical work where students were supposed to design a software system, given some functional requirements from automotive industry. In addition, the students were supposed to formally analyse their architecture using AADL and OSATE.*

#### **Software Development for Real-Time Systems**

Fall 2018–2022

My responsibilities: *Lab design and evaluation of practical work where students were supposed to design a software system, given some timing requirements from the automotive systems.*

## Skills

### **Programming**

Proficient in: Clojure, Matlab, Python, ClojureScript, Java

Familiar with: Rust, C#, C, R

### **Languages**

Fluent in: Montenegrin, Croatian, Serbian, Bosnian, English

Basic user in: Italian

## Committees

### Participation in Organising Committees

2021 – Present

- ◇ RTNS 2021 (Session 5 chair: Design and verification)

### Participation in Technical Program Committees

2019 – Present

- ◇ ISORC 2022 (Program Committee)
- ◇ NG-RES 2022 (HiPEAC Workshop Program Committee)
- ◇ ECRTS 2022 (Artifact Evaluation Committee)
- ◇ ECRTS 2022 (External Reviewer)
- ◇ RTAS 2022 (Brief Presentations Track Committee)
- ◇ RTAS 2021 (Artifact Evaluation Committee)
- ◇ RTNS 2021 (Program Committee)
- ◇ ICIT 2019 (Program Committee in a special session)

## Publication list

All publications are listed in a reverse chronological order, starting from the next page. The publications are categorised in the following three categories:

- ◇ Peer-reviewed original articles, i.e. journal articles,
- ◇ Peer-reviewed conference contributions, and
- ◇ Thesis work.

For each conference contribution, the acceptance rate is provided, if available. In addition, the conference rankings are provided. For the article contribution, the impact factor of the journal is provided.

**Note about the provided rankings**

The conference ranks are reported according to CORE 2021 rankings. According to this ranking, the following are the categories to which the conferences are assigned:

**A\*** – flagship conference, a leading venue in a discipline area,

**A** – excellent conference, and highly respected in a discipline area,

**B** – good to very good conference, and well regarded in a discipline area,

**C** – Assigned to the other conference that satisfies minimum standards.

**Source:** <http://www.core.edu.au/conference-portal>

The publication list is available on the following page.

## Publication list

### Peer-reviewed original articles

- A1 Title: *A Comparison of Partitioning Strategies for Fixed Points Based Limited Preemptive Scheduling*  
(**Part of PhD thesis**)  
Authors: **Filip Marković**, Jan Carlson, and Radu Dobrin  
Journal: IEEE Transactions on Industrial Informatics  
Year: 2019  
Volume: 15  
Number: 2  
Pages: 1070-1081  
Impact factor: **10.215**

### Peer-reviewed conference contributions

- C9 Title: *Analytical approximations in probabilistic analysis of real-time systems*  
Authors: **Filip Marković**, Alessandro V. Papadopolous, and Thomas Nolte  
Venue: The 43rd IEEE Conference on Real-Time Systems Symposium (RTSS 2022)  
Conference rank: A\*  
Acceptance rate: not available yet
- C8 Title: *Scheduling Elastic Applications in Compositional Real-Time Systems*  
Authors: Shaik Mohammed Salman, Saad Mubeen, **Filip Marković**, Alessandro V. Papadopolous, and Thomas Nolte  
Venue: The 26th IEEE Conference on Emerging Technologies and Factory Automation (ETFA 2021)  
Conference rank: not available  
Acceptance rate: 66%
- C7 Title: *On the convolution efficiency for probabilistic analysis of real-time systems*  
(**Outstanding paper award**)  
Authors: **Filip Marković**, Alessandro V. Papadopolous, and Thomas Nolte  
Venue: The 33rd Euromicro Conference on Real-Time Systems (ECRTS 2021)  
Conference rank: A  
Acceptance rate: 19%
- C6 Title: *Adaptive Runtime Estimate of Task Execution Times using Bayesian Modeling*  
Authors: Anna Friebe, **Filip Marković**, Alessandro V. Papadopoulos, Thomas Nolte  
Venue: The 27th IEEE International Conference on Embedded and Real-Time Computing Systems and Applications (RTCSA 2021)  
Conference rank: B  
Acceptance rate: 42%
- C5 Title: *Improving the accuracy of cache-aware response time analysis using preemption partitioning*  
(**Part of PhD thesis**)  
Authors: **Filip Marković**, Jan Carlson, Radu Dobrin, and Sebastian Altmeyer  
Venue: The 32nd Euromicro Conference on Real-Time Systems (ECRTS 2020)

Conference rank: **A**

Acceptance rate: 34%

C4 Title: *Cache-aware response time analysis for real-time tasks with fixed preemption points*

**(Part of PhD thesis)**

Authors: **Filip Marković**, Jan Carlslon, and Radu Dobrin

Venue: The 26th IEEE Real-Time and Embedded Technology and Applications Symposium (RTAS 2020)

Conference rank: **A**

Acceptance rate: 27%

C3 Title: *Improved cache-related preemption delay estimation for fixed preemption point scheduling*

**(Part of PhD thesis)**

Authors: **Filip Marković**, Jan Carlslon, Radu Dobrin

Venue: The 23rd International Conference on Reliable Software Technologies (Ada-Europe 2018)

Conference rank: **B**

Acceptance rate: 37%

C2 Title: *Probabilistic response time analysis for fixed preemption point selection*

Authors: **Filip Marković**, Jan Carlslon, Radu Dobrin, Björn Lisper, Abhilash Thekkilakattil

Venue: The 13th IEEE International Symposium on Industrial Embedded Systems (SIES 2018)

Conference rank: not available

Acceptance rate: not available

C1 Title: *Tightening the bounds on cache-related preemption delay in fixed preemption point scheduling*

**(Part of PhD thesis)**

Authors: **Filip Marković**, Jan Carlslon, and Radu Dobrin

Venue: The 17th International Workshop on Worst-Case Execution Time Analysis (WCET 2017)

Conference rank: not available

Acceptance rate: 71%

## Thesis work

T3 Title: *Preemption-Delay Aware Schedulability Analysis of Real-Time Systems*

**(PhD thesis)**

Author: **Filip Marković**

Year: 2020

Series: Mälardalen University Press Dissertations, ISSN 1651-4238 ; 315

ISBN: 978-91-7485-467-1 (print)

T2 Title: *Improving the Schedulability of Real Time Systems under Fixed Preemption Point Scheduling*

**(Licentiate thesis)**

Author: **Filip Marković**

Year: 2018

Series: Mälardalen University Press Licentiate Theses, ISSN 1651-9256 ; 270

ISBN: 978-91-7485-390-2 (print)

T1 Title: *Automated test generation for structured text language using UPPAAL model checker*  
(**Master thesis**)  
Author: **Filip Marković**  
Year: 2015