

# Dr. rer. nat. Igor Kalkov



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## Research Topics

- Mobile and Real-Time Systems
  - RTAndroid ([Project](#))
  - Java Real-Time Systems
- Soft PLCs
  - IEC 61131-3
  - Execution and Simulation of PLC Programs on RTAndroid

## Open Theses

- On request

## Supervised Theses

- [Anforderungsanalyse und prototypische Umsetzung einer Entwicklungsumgebung für Structured Text auf RTAndroid](#)
- [Flexible Konfiguration eines mikrocontrollerbasierten Feldgeräteadapters für RTAndroid](#)
- [Ausführung und Simulation von SPS-Programmen auf RTAndroid](#)
- [Stabilisierung und Test von Real-Time Android](#)
- [Steuerung einer Fertigungsanlage mit RTAndroid](#)
- [Entwicklung einer Real-Time Activity für die Android Plattform](#)

## Teaching

Semester	Title	Type
Summer Semester 15	<a href="#">Dienste in der Industrie 4.0</a>	S
Winter Semester 14/15	<a href="#">Einführung in die Technische Informatik</a>	V/Ü
	<a href="#">Ausgesuchte Themen zur Eingebetteten Software</a>	S

Summer Semester 14	<a href="#">Entwicklung NXT gesteuerter LEGO-Fahrzeuge mit Java</a>	P
Winter Semester 13/14	<a href="#">Einführung in die Technische Informatik</a>	V/Ü
Summer Semester 13	<a href="#">Entwicklung NXT gesteuerter LEGO-Fahrzeuge mit Java</a>	P
	<a href="#">Praktikum Systemprogrammierung</a>	P
Winter Semester 12/13	<a href="#">Einführung in die Technische Informatik</a>	V/Ü
Summer Semester 12	<a href="#">Entwicklung NXT gesteuerter LEGO-Fahrzeuge mit Java</a>	P
	<a href="#">Praktikum Systemprogrammierung</a>	P
Winter Semester 11/12	<a href="#">Einführung in die Technische Informatik</a>	V/Ü

## Office Hours

By appointment

## Publications

[Kal17]

[PDFBIB](#)

Kalkov, I., "A real-time capable, open-source-based platform for off-the-shelf embedded devices", PhD Thesis, Aachen, 2017.

### A real-time capable, open-source-based platform for off-the-shelf embedded devices

#### Bibtex entry :

```
@phdthesis { Kal17,  
  author = { Kalkov, Igor },  
  othercontributors = { Kowalewski, Stefan and A{\ss}mann, Uwe },  
  title = { A real-time capable, open-source-based platform for  
    off-the-shelf embedded devices },  
  publisher = { RWTH Aachen University, Department of Computer  
Science },  
  school = { RWTH Aachen University },  
  pages = { 1 Online-Ressource (xx, 114 Seiten) : Illustrationen,  
    Diagramme },  
  series = { Aachener Informatik-Berichte },  
  year = { 2017 },  
  address = { Aachen },  
  doi = { 10.18154/RWTH-2018-222005 },  
  typ = { PUB:(DE-HGF)3 },  
  reportid = { RWTH-2018-222005 },  
  cin = { 122810 / 120000 },  
  url = {  
http://publications.rwth-aachen.de/record/719343/files/719343.pdf },  
}
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[KGK17]

[PDFBIB](#)

Kalkov, I., Gurghian, A., and Kowalewski, S., "Explicit prioritization of parallel Intent broadcasts in real-time Android", in *Proc. Concurrency and computation*, Chichester, 2017, vol. 29, Wiley.

## Explicit prioritization of parallel Intent broadcasts in real-time Android

**Bibtex entry :**

```
@inproceedings { KGK17,
  author = { Kalkov, Igor and Gurghian, Alexandru and Kowalewski,
Stefan },
  title = { Explicit prioritization of parallel Intent broadcasts in
real-time Android },
  booktitle = { Concurrency and computation },
  publisher = { Wiley },
  volume = { 29 },
  number = { 22 },
  year = { 2017 },
  address = { Chichester },
  issn = { 1532-0626 },
  organization = { 12th International workshop on Java Technologies
for
Real-Time and Embedded systems, Niagara Falls, NY (USA),
2014-10-13 - 2014-10-14 },
  doi = { 10.1002/cpe.4122 },
  typ = { PUB:(DE-HGF)16 },
  reportid = { RWTH-2017-09553 },
  cin = { 122810 / 120000 },
  url = { http://publications.rwth-aachen.de/record/707959 },
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```

[KGK15]

[PDFBIB](#)

Kalkov, I., Gurghian, A., and Kowalewski, S., "Priority Inheritance during Remote Procedure Calls in Real-Time Android using Extended Binder Framework", in *Proc. Proceedings of the 13th International Workshop on Java Technologies for Real-time and Embedded Systems - JTRES '15 - ACM Press New York, New York, USA, 2015*, 2015, ACM Press New York, New York, USA, p. 5.

## Priority Inheritance during Remote Procedure Calls in Real-Time Android using Extended Binder Framework

**Bibtex entry :**

```
@inproceedings { KGK15,
  author = { Kalkov, Igor and Gurghian, Alexandru and Kowalewski,
Stefan },
  title = { Priority Inheritance during Remote Procedure Calls in
```

```
Real-Time Android using Extended Binder Framework },
booktitle = { Proceedings of the 13th International Workshop on
Java
Technologies for Real-time and Embedded Systems - JTRES '15
- ACM Press New York, New York, USA, 2015 },
publisher = { ACM Press New York, New York, USA },
pages = { 5, 10 Seiten },
year = { 2015 },
organization = { 13th International Workshop on Java Technologies
for
Real-time and Embedded Systems, Paris (France), 2015-10-07
- 2015-10-08 },
doi = { 10.1145/2822304.2822311 },
typ = { PUB:(DE-HGF)8 },
reportid = { RWTH-2016-03747 },
cin = { 122810 / 120000 },
url = { http://publications.rwth-aachen.de/record/573802 },
}
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[KKO+15]

[PDFBIB](#)

Kowalewski, S., Kalkov, I., Obster, M., and Thönnessen, D., "Echtzeiterweiterung für Android: SPS inside", *IEE - Elektrische Automatisierung + Antriebstechnik*, pp. 58-61, 2015

## Echtzeiterweiterung für Android: SPS inside

### Bibtex entry :

```
@article { KKO+15,
author = { Kowalewski, Stefan and Kalkov, Igor and Obster, Mathias
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Th{"o}nnessen, David },
title = { Echtzeiterweiterung f{"u}r Android: SPS inside },
journal = { IEE - Elektrische Automatisierung + Antriebstechnik },
publisher = { IEE },
pages = { 58-61 },
year = { 2015 },
issn = { 1434-2898 },
typ = { PUB:(DE-HGF)16 },
reportid = { RWTH-CONV-236305 },
cin = { 122810 / 120000 },
url = { http://publications.rwth-aachen.de/record/752275 },
}
```

[AFK+14]

[PDFBIB](#)

Armoush, A., Franke, D., Kalkov, I., and Kowalewski, S., "An Approach for Using Mobile Devices In Industrial Safety-Critical Embedded Systems" Cham: Springer, 2014, vol. 130, pp. 294-297.

# An Approach for Using Mobile Devices In Industrial Safety-Critical Embedded Systems

## Bibtex entry :

```
@inbook { AFK+14,
  author = { Armoush, Ashraf and Franke, Dominik and Kalkov, Igor and
    Kowalewski, Stefan },
  title = { An Approach for Using Mobile Devices In Industrial
    Safety-Critical Embedded Systems },
  booktitle = { Mobile Computing, Applications, and Services : 5th
    International Conference, MobiCase 2013, Paris, France,
    November 7-8, 2013, Revised Selected Papers },
  publisher = { Springer },
  pages = { 294-297 },
  volume = { 130 },
  series = { Lecture Notes of the Institute for Computer Sciences,
    Social-Informatics and Telecommunications Engineering },
  year = { 2014 },
  address = { Cham },
  doi = { 10.1007/978-3-319-05452-0_27 },
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  reportid = { RWTH-CONV-203202 },
  cin = { 120000 / 122810 },
  url = { http://publications.rwth-aachen.de/record/225590 },
}
```

[KGK14]

[PDFBIB](#)

Kalkov, I., Gurchian, A., and Kowalewski, S., "Predictable Broadcasting of Parallel Intents in Real-Time Android" New York, New York: ACM, 2014, pp. 57-66.

## Predictable Broadcasting of Parallel Intents in Real-Time Android

## Bibtex entry :

```
@inbook { KGK14,
  author = { Kalkov, Igor and Gurchian, Alexandru and Kowalewski,
    Stefan },
  title = { Predictable Broadcasting of Parallel Intents in Real-Time
    Android },
  booktitle = { Proceedings of the 12th International Workshop on
    Java
    Technologies for Real-time and Embedded Systems : JTRES 2014
    : Niagara Falls, NY, USA, October 13th-14th, 2014 },
  publisher = { ACM },
  pages = { 57-66 },
  series = { ACM international conference proceedings series },
```

```
year = { 2014 },
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for
    Real-time and Embedded Systems, Niagara Falls, NY (USA),
    2014-10-13 - 2014-10-14 },
typ = { PUB:(DE-HGF)8 },
reportid = { RWTH-CONV-205503 },
cin = { 120000 / 122810 },
url = { http://publications.embedded.rwth-aachen.de/file/5g },
}
```

[OKK14]

[PDFBIB](#)

Obster, M., Kalkov, I., and Kowalewski, S., "Development and Execution of PLC Programs on Real-Time Capable Mobile Devices", in *Proc. 2014 IEEE [International Conference on] Emerging Technologies and Factory Automation (ETFA 2014) : Barcelona, Spain, 16 - 19 September 2014 / [co-sponsored by Universitat Politècnica de Catalunya - Barcelona Tech (UPC); IEEE Industrial Electronics Society]*, Piscataway, NJ, 2014, IEEE, p. 8.

## Development and Execution of PLC Programs on Real-Time Capable Mobile Devices

### Bibtex entry :

```
@inproceedings { OKK14,
  author = { Obster, Mathias and Kalkov, Igor and Kowalewski, Stefan
},
  title = { Development and Execution of PLC Programs on Real-Time
    Capable Mobile Devices },
  booktitle = { 2014 IEEE [International Conference on] Emerging
    Technologies and Factory Automation (ETFA 2014) : Barcelona,
    Spain, 16 - 19 September 2014 / [co-sponsored by Universitat
    Politècnica de Catalunya - Barcelona Tech (UPC); IEEE
    Industrial Electronics Society] },
  publisher = { IEEE },
  pages = { 8 Seiten },
  year = { 2014 },
  address = { Piscataway, NJ },
  organization = { 2014 IEEE [International Conference on] Emerging
    Technologies and Factory Automation, Barcelona (Spain),
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  doi = { 10.1109/ETFA.2014.7005218 },
  typ = { PUB:(DE-HGF)7 },
  reportid = { RWTH-CONV-206433 },
  cin = { 120000 / 122810 },
  url = { http://publications.rwth-aachen.de/record/444615 },
}
```

[GKS+13]

[PDFBIB](#)

Gerlitz, T., Kalkov, I., Schommer, J. F., Franke, D., and Kowalewski, S., "Non-Blocking Garbage Collection for Real-Time Android" New York, NY: ACM, 2013, pp. 108-117.

## Non-Blocking Garbage Collection for Real-Time Android

### Bibtex entry :

```
@inbook { GKS+13,
  author = { Gerlitz, Thomas and Kalkov, Igor and Schommer, John F.
and
  Franke, Dominik and Kowalewski, Stefan },
  title = { Non-Blocking Garbage Collection for Real-Time Android },
  booktitle = { 11th International Workshop on Java Technologies for
Real-time and Embedded Systems : JTRES 2013 ; 9-10 October
2013, Karlsruhe, Germany },
  publisher = { ACM },
  pages = { 108-117 },
  series = { ACM Digital Library },
  year = { 2013 },
  address = { New York, NY },
  doi = { 10.1145/2512989.2512999 },
  typ = { PUB:(DE-HGF)8 },
  reportid = { RWTH-CONV-202515 },
  cin = { 120000 / 122810 },
  url = { http://publications.rwth-aachen.de/record/224782 },
}
```

[KFS+12]

[PDFBIB](#)

Kalkov, I., Franke, D., Schommer, J. F., and Kowalewski, S., "A Real-time Extension to the Android Platform", in *Proc. JTRES 2012 : proceedings of the 10th International Workshop on Java Technologies for Real-time and Embedded Systems, October 24-26, 2012, Copenhagen, Denmark / Andy Wellings ...*, New York, N.Y., 2012 in ACM conference proceedings series, ACM Press, pp. 105-114.

## A Real-time Extension to the Android Platform

### Bibtex entry :

```
@inproceedings { KFS+12,
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Workshop
on Java Technologies for Real-time and Embedded Systems,
October 24-26, 2012, Copenhagen, Denmark / Andy Wellings ... },
  publisher = { ACM Press },
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series = { ACM conference proceedings series },
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typ = { PUB:(DE-HGF)8 },
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cin = { 120000 / 122810 },
url = { http://publications.rwth-aachen.de/record/129215 },
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<https://www.embedded.rwth-aachen.de/doku.php?id=en:lehrstuhl:mitarbeiter:kalkov>

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