

Real-Time Android



RTAndroid platform makes real-time Android possible. With its ability to serve real-time requests, RTAndroid enlarges the field of application of mobile Android devices to time-critical domains. They could be used for in-field monitoring in industrial plants or as an integrated automation platform. This project evaluates the applicability of a RTAndroid-based solution in scenarios typical for programmable logic controllers (PLCs). Continuous improvements in the portability, usability and computational power of modern tablet PCs allow the development of new environments for working with PLC-common programming languages. Given the fundamental real-time support, RTAndroid can be used as a platform for an all-in-one solution including development, simulation and execution of typical PLC programs, as well as the communication to external hardware.

Details

More information about the project can be found here: [Real-Time Android](#)

Contacts

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[David Thönnessen, M.Sc. RWTH](#)

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 :

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@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 },  
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http://publications.rwth-aachen.de/record/719343/files/719343.pdf },  
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[KGK17]

[PDFBIB](#)

Kalkov, I., Gurchian, 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 Gurchian, Alexandru and Kowalewski,  
Stefan },  
  title = { Explicit prioritization of parallel Intent broadcasts in  
    real-time Android },  
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  issn = { 1532-0626 },  
  organization = { 12. International workshop on Java Technologies
```

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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., Gurchian, 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*, New York, NY, 2015 in ACM Other conferences, ACM, p. 5.

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

Bibtex entry :

```

@inproceedings { KGK15,
    author = { Kalkov, Igor and Gurchian, 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 },
    publisher = { ACM },
    pages = { 5, 10 Seiten },
    series = { ACM Other conferences },
    year = { 2015 },
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    organization = { 13. International Workshop on Java Technologies
for
Real-time and Embedded Systems, Paris (France), 2015-10-07 -
2015-10-08 },
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    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 :

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@article { KK0+15,  
  author = { Kowalewski, Stefan and Kalkov, Igor and Obster, Mathias  
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  Th{"o}nnessen, David },  
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  journal = { IEE - Elektrische Automatisierung + Antriebstechnik },  
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  pages = { 58-61 },  
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[AFK+14]

[PDFBIB](#)

Armoush, A., Franke, D., Kalkov, I., and Kowalewski, S., "An Approach for Using Mobile Devices In Industrial Safety-Critical Embedded Systems", in *Proc. Mobile Computing, Applications, and Services : 5th International Conference, MobiCase 2013, Paris, France, November 7-8, 2013, Revised Selected Papers*, Cham, 2014 in Lecture Notes of the Institute for Computer Sciences, Social-Informatics and Telecommunications Engineering, Springer, pp. 294-297.

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

Bibtex entry :

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@inproceedings { 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 },  
  series = { Lecture Notes of the Institute for Computer Sciences,  
Social-Informatics and Telecommunications Engineering },  
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  organization = { Mobile Computing, Applications, and Services : 5.  
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    2013-11-08 },
    doi = { 10.1007/978-3-319-05452-0_27 },
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    cin = { 120000 / 122810 },
    url = { http://publications.rwth-aachen.de/record/225590 },
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[KGK14]

[PDFBIB](#)

Kalkov, I., Gurchian, A., and Kowalewski, S., "Predictable Broadcasting of Parallel Intents in Real-Time Android", in *Proc. 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*, New York, New York, 2014 in ACM international conference proceedings series, ACM, pp. 57-66.

Predictable Broadcasting of Parallel Intents in Real-Time Android

Bibtex entry :

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@inproceedings { KGK14,
  author = { Kalkov, Igor and Gurchian, Alexandru and Kowalewski, Stefan },
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  pages = { 57-66 },
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  year = { 2014 },
  address = { New York, New York },
  organization = { 12. International Workshop on Java Technologies for Real-time and Embedded Systems, Niagara Falls, NY (USA), 2014-10-13 - 2014-10-14 },
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  cin = { 120000 / 122810 },
  url = { http://publications.embedded.rwth-aachen.de/file/5g },
}

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[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 :

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@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),  
    2014-09-16 - 2014-09-19 },  
  doi = { 10.1109/ETFA.2014.7005218 },  
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  cin = { 120000 / 122810 },  
  url = { http://publications.rwth-aachen.de/record/444615 },  
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[GKS+13]

[PDFBIB](#)

Gerlitz, T., Kalkov, I., Schommer, J. F., Franke, D., and Kowalewski, S., "Non-Blocking Garbage Collection for Real-Time Android", in *Proc. 11th International Workshop on Java Technologies for Real-time and Embedded Systems : JTRES 2013 ; 9-10 October 2013, Karlsruhe, Germany*, New York, NY, 2013 in ACM Digital Library, ACM, pp. 108-117.

Non-Blocking Garbage Collection for Real-Time Android

Bibtex entry :

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@inproceedings { GKS+13,  
  author = { Gerlitz, Thomas and Kalkov, Igor and Schommer, John F.  
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  title = { Non-Blocking Garbage Collection for Real-Time Android },  
  booktitle = { 11th International Workshop on Java Technologies for
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Real-time and Embedded Systems : JTRES 2013 ; 9-10 October
2013, Karlsruhe, Germany },
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pages = { 108-117 },
series = { ACM Digital Library },
year = { 2013 },
address = { New York, NY },
organization = { Java-Technologien f{"u}r Echtzeit- und
eingebettete
Systeme, Karlsruhe (Germany), 2013-10-09 - 2013-10-10 },
doi = { 10.1145/2512989.2512999 },
typ = { PUB:(DE-HGF)8 },
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cin = { 120000 / 122810 },
url = { http://publications.rwth-aachen.de/record/224782 },
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[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 :

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@inproceedings { KFS+12,
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and
  Kowalewski, Stefan },
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  booktitle = { 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 ... },
  publisher = { ACM Press },
  pages = { 105-114 },
  series = { ACM conference proceedings series },
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  organization = { 10. International Workshop on Java Technologies
for
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2012-10-24 - 2012-10-26 },
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