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Kontakt



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Forschung

[ECLA-VENT](#)
[AutoMock](#)

Lehre

WS2017/18:

- [Dynamic Systems for Computer Scientists \(V\)](#)
- [Cyber-Physische Systeme in Medizintechnik und Mobilität \(S\)](#)

WS2016/17:

- [Dynamic Systems for Computer Scientists \(V\)](#)
- [Eingebettete Software in Medizintechnik & eMobilität \(S\)](#)

SS2016:

- [Eingebettete Software in Medizintechnik & eMobilität \(S\)](#)

WS2015/16:

- [Dynamic Systems for Computer Scientists \(V\)](#)
- [Eingebettete Signalverarbeitung in Medizintechnik & eMobilität \(S\)](#)

WS2014/15:

- [Dynamic Systems for Computer Scientists \(V\)](#)
- [Ausgesuchte Themen zur Eingebetteten Software \(S\)](#)

WS2013/14:

- [Safe and Sound: Testing and Model Checking of Embedded Systems \(S\)](#)
- [Dynamic Systems for Computer Scientists \(V\)](#)

Betreute Abschlussarbeiten

- [Eingebette Rezirkulationsmessung für ECLA-Systeme](#)
- [Editor und Steuerungsapplikation für pulsatile Blutflüsse](#)
- [Rezirkulationsmessung bei extrakorporaler Lungenunterstützung](#)
- [Auslegung einer pulsatilen Ansteuerungsstrategie für eine Blutpumpe](#)
- [Modellierung und Analyse von konkurrierenden Sicherheitszielen in einer intensivmedizinischen Anwendung](#)

Publikationen

[WBK+23]

PDFBIB

Wiertalla, M. O., Berg, F. J., Kühn, J., Buglowski, M., Bleilevens, C., Kowalewski, S., and Stollenwerk, A., "A fully automated normothermic machine perfusion system for kidney grafts supporting physiological motivated flow profiles", *Current directions in biomedical engineering*, vol. 9, iss. 1, pp. 323-326, 2023

A fully automated normothermic machine perfusion system for kidney grafts supporting physiological motivated flow profiles

Bibtex entry :

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@article { WBK+23,
  author = { Wiertalla, Marc Oliver and Berg, Frederik Julius and
    K{"u}hn, Jan and Buglowski, Mateusz and Bleilevens,
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  title = { A fully automated normothermic machine perfusion system
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  journal = { Current directions in biomedical engineering },
  publisher = { De Gruyter },
  pages = { 323-326 },
  volume = { 9 },
  number = { 1 },
  year = { 2023 },
  address = { Berlin },
  issn = { 2364-5504 },
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organization = { 57. DGBMT Annual Conference on Biomedical
Engineering,
    Duisburg (Germany), 2023-09-26 - 2023-09-28 },
doi = { 10.1515/cdbme-2023-1081 },
typ = { PUB:(DE-HGF)16 },
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    Entwicklung eines vollautomatisierten in vitro Teststands
    (Mock Loop) - Ein k{"u"}nstlicher Kreislauf als
    Ersatzmethode zur Biokompatibilit{"a"}tstestung von
    Membranoxygenatoren und zur Transplantationssimulation
    (BMBF-031L0134B) },
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[WBO+23a]

[PDFBIB](#)

Wiertalla, M. O., Berg, F. J., Ottersbach, F., Kühn, J., Buglowski, M., Kowalewski, S., and Stollenwerk, A., "A modular and verifiable software architecture for interconnected medical systems in intensive care", *Annals of computer science and information systems*, vol. 37, pp. 345-351, 2023

A modular and verifiable software architecture for interconnected medical systems in intensive care

Bibtex entry :

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@article { WBO+23a,
    author = { Wiertalla, Marc Oliver and Berg, Frederik Julius and
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    title = { A modular and verifiable software architecture for
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    journal = { Annals of computer science and information systems },
    publisher = { Polish Information Processing Society },
    pages = { 345-351 },
    volume = { 37 },
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    isbn = { 978-83-969601-3-9 },
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    doi = { 10.15439/2023F6208 },
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  (BMBF-031L0134B) },
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[KBS+19]

[PDFBIB](#)

Kühn, J., Buglowski, M., Stollenwerk, A., Kowalewski, S., Walter, M., Leonhardt, S., Petran, J., Kopp, R., Rossaint, R., and Janisch, T., "Fault Identification in a Blood Pump Using Neural Networks", in *Proc. World Congress on Medical Physics and Biomedical Engineering 2018 : June 3-8, 2018, Prague, Czech Republic (Vol.2) / edited by Lenka Lhotska, Lucie Sukupova, Igor Lacković, Geoffrey S. Ibbott*, Singapore, 2019 in IFMBE Proceedings, Springer Singapore, pp. 27-32.

Fault Identification in a Blood Pump Using Neural Networks

Bibtex entry :

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@inproceedings { KBS+19,
  author = { Kühn, Jan and Buglowski, Mateusz and Stollenwerk,
André
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Steffen and Petran, Jan and Kopp, Rüdiger and Rossaint,
Rolf and Janisch, Thorsten },
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  2018 : June 3-8, 2018, Prague, Czech Republic (Vol.2) /
edited by Lenka Lhotska, Lucie Sukupova, Igor Lacković,
Geoffrey S. Ibbott },
  publisher = { Springer Singapore },
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  Engineering, Prague (Czech Republic), 2018-06-03 -
2018-06-08 },
  doi = { 10.1007/978-981-10-9038-7_6 },
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[KSK+18]

[PDFBIB](#)

Kühn, J., Stollenwerk, A., Kowalewski, S., Fabry, G., Grzanna, T., Doorschodt, B., Tolba, R. H., Rossaint, R., and Bleilevens, C., "A long-term setup for kidney perfusion." 2018.

A long-term setup for kidney perfusion

Bibtex entry :

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@inproceedings { KSK+18,
    author = { K{"u}hn, Jan and Stollenwerk, André and Kowalewski,
Stefan
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    title = { A long-term setup for kidney perfusion },
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    (BMBF-031L0134B) },
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```

[SBK18]

[PDFBIB](#)

Stollenwerk, A., Buglowski, M., and Kühn, J., "Mock loop for bubble generation in a centrifugal blood pump for fault simulation", *Current Directions in Biomedical Engineering*, vol. 4, iss. 1, pp. 33-36, 2018

Mock loop for bubble generation in a centrifugal blood pump for fault simulation

Bibtex entry :

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@article { SBK18,  
  author = { Stollenwerk, André and Bugłowski, Mateusz and Kühn, Jan },  
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[WKJ+18]

[PDFBIB](#)

Walter, M., Kühn, J., Janisch, T., Petran, J., Kopp, R., and Leonhardt, S., "Cooperative automation of extracorporeal gas exchange and artificial ventilation", in *Proc. World Congress on Medical Physics & Biomedical Engineering : June 3-8, 2018, Prague, Czech Republic : IUPESM Pague 2018 : Book of Abstracts*, 2018, pp. 663-664.

Cooperative automation of extracorporeal gas exchange and artificial ventilation

Bibtex entry :

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@inproceedings { WKJ+18,  
  author = { Walter, Marian and Kühn, J. and Janisch, Thorsten  
and  
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[BHK+17]

[PDFBIB](#)

Brendle, C., Hackmack, K. -F., Kühn, J., Wardeh, M. N., Janisch, T., Kopp, R., Rossaint, R., Stollenwerk, A., Kowalewski, S., Leonhardt, S., Walter, M., and Misgeld, B. J. E., "Closed-loop control of extracorporeal oxygen and carbon dioxide gas transfer", *Control engineering practice*, vol. 59, pp. 173-182, 2017

Closed-loop control of extracorporeal oxygen and carbon dioxide gas transfer

Bibtex entry :

```

@article { BHK+17,
  author = { Brendle, Christian and Hackmack, K.-F. and K{"u}hn, Jan
and
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  pages = { 173-182 },
  volume = { 59 },
  year = { 2017 },
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die Therapie des Lungenversagens (ECLA-VENT) (224967929) },
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[BMK+17]

[PDFBIB](#)

Brendle, C., Mülders, T., Kühn, J., Janisch, T., Kopp, R., Rossaint, R., Stollenwerk, A., Kowalewski, S., Misgeld, B. J. E., Leonhardt, S., and Walter, M., "Physiological closed-loop control of mechanical ventilation and extracorporeal membrane oxygenation", *Biomedical engineering = Biomedizinische Technik*, vol. 62, iss. 2, pp. 199-212, 2017

Physiological closed-loop control of mechanical ventilation and extracorporeal membrane oxygenation

Bibtex entry :

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@article { BMK+17,
  author = { Brendle, Christian and M{"u}lders, Thorsten and
K{"u}hn,
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Misgeld, Berno Johannes Engelbert and Leonhardt, Steffen and
Walter, Marian },
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  pages = { 199-212 },
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  url = { http://publications.rwth-aachen.de/record/707843 },
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[DKK17]

[PDFBIB](#)

Dernehl, C., Kühn, J., and Kowalewski, S., "Case studies on automated verification with slope boundaries for block diagrams", *Computer Languages, Systems & Structures*, vol. 54, pp. 528-543, 2017

Case studies on automated verification with slope boundaries for block diagrams

Bibtex entry :

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@article { DKK17,
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author = { Dernehl, Christian and K{"u}hn, Jan and Kowalewski,
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volume = { 54 },
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issn = { 1477-8424 },
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typ = { PUB:(DE-HGF)16 },
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[KBS+17]

[PDFBIB](#)

Kühn, J., Brendle, C., Stollenwerk, A., Schweigler, M., Kowalewski, S., Janisch, T., Rossaint, R., Leonhardt, S., Walter, M., and Kopp, R., "Decentralized safety concept for closed-loop controlled intensive care : Supervision of a blood pump during extracorporeal circulation", *Biomedical engineering = Biomedizinische Technik*, vol. 62, iss. 2, pp. 213-224, 2017

Decentralized safety concept for closed-loop controlled intensive care : Supervision of a blood pump during extracorporeal circulation

Bibtex entry :

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@article { KBS+17,
author = { K{"u}hn, Jan and Brendle, Christian and Stollenwerk,
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Thorsten and Rossaint, Rolf and Leonhardt, Steffen and
Walter, Marian and Kopp, R{"u}dger },
title = { Decentralized safety concept for closed-loop controlled
intensive care : Supervision of a blood pump during
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typ = { PUB:(DE-HGF)16 },
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[WKK+17]

PDFBIB

Walter, M., Kunczik, J., Kühn, J., Janisch, T., Kopp, R., and Leonhardt, S., "Robust control of extracorporeal gas exchange", in *Proc. Abstract Book at EMBEC'17 & NBC'17 : the Joint conference of the European Medical and Biological Engineering Conference (EMBEC) and the Nordic-Baltic Conference on Biomedical Engineering and Medical Physics (NBC) : Tampere, Finland / Editors: Jennika Karvinen, Janne Koivisto, Sampo Tuukkanen, Jari Viik*, Finland, 2017, BioMediTech Institute and Faculty of Biomedical Sciences and Engineering Tampere University of Technology, p. 365, 150-150.

Robust control of extracorporeal gas exchange

Bibtex entry :

```

@inproceedings { WKK+17,
  author = { Walter, Marian and Kunczik, Janosch and Kühn, Jan
and
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(EMBEC) and the Nordic-Baltic Conference on Biomedical
Engineering and Medical Physics (NBC) : Tampere, Finland /
Editors: Jennika Karvinen, Janne Koivisto, Sampo Tuukkanen,
Jari Viik },
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Sciences and
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  pages = { 365, 150-150 },
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Conference on Biomedical Engineering and Medical Physics
(NBC), Tampere (Finland), 2017-06-11 - 2017-06-15 },
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[BHK+16]

PDFBIB

Brendle, C., Hackmack, K. -F., Kühn, J., Wardeh, M. N., Janisch, T., Kopp, R., Rossaint, R., Stollenwerk, A., Kowalewski, S., Misgeld, B. J. E., Leonhardt, S., and Walter, M., "Continuous gas transfer monitoring during extracorporeal membrane oxygenation", *Biomedical signal processing and control*, vol. 31, pp. 321-330, 2016

Continuous gas transfer monitoring during extracorporeal membrane oxygenation

Bibtex entry :

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@article { BHK+16,
  author = { Brendle, Christian and Hackmack, K.-F. and Kühn, Jan
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  title = { Continuous gas transfer monitoring during extracorporeal
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  cin = { 611010 / 122810 / 120000533000-2 },
  url = { http://publications.rwth-aachen.de/record/678132 },
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[DKK16]

PDFBIB

Dernehl, C., Kühn, J., and Kowalewski, S., "Abstract Interpretation for Block Diagrams : Two Case Studies", in *Proc. MoDeVva 2016 : Model-Driven Engineering, Verification and Validation : proceedings of the 13th Workshop on Model-Driven Engineering, Verification and Validation co-located with ACM/IEEE 19th International Conference on Model Driven Engineering Languages and Systems (MODELS 2016) : Saint-Malo, France, October 3, 2016 / edited by Michalis Famelis, Daniel Ratiu, Gehan M. K. Selim, Aachen, Germany, 2016* in CEUR workshop proceedings, RWTH Aachen, pp. 20-29.

Abstract Interpretation for Block Diagrams : Two Case Studies

Bibtex entry :

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@inproceedings { DKK16,
  author = { Dernehl, Christian and K{"u}hn, Jan and Kowalewski,
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[KSB+16]

[PDFBIB](#)

Kühn, J., Stollenwerk, A., Brendle, C., Janisch, T., Walter, M., Rossaint, R., Leonhardt, S., Kowalewski, S., and Kopp, R., "Sensor Supervision and Control Value Limitations in Networked Intensive Care", in *Proc. [Gemeinsamer Tagungsband der Workshops der Tagung Software Engineering 2016 (SE-WS 2016), Wien, 23.-26. Februar 2016 / Edited by: Wolf Zimmermann, Lukas Alperowitz, Bernd Brügge, Jörn Fahsel, Andrea Herrmann, Anne Hoffmann, Andreas Krall, Dieter Landes, Horst Lichter, Dirk Riehle, Ina Schaefer, Constantin Scheuermann, Alexander Schlaefer, Sibylle Schupp, Andreas Seitz, Andreas Steffens, André Stollenwerk, Rüdiger Weißbach]*, Aachen, Germany, 2016 in CEUR Workshop Proceedings, RWTH Aachen, pp. 187-194.

Sensor Supervision and Control Value Limitations in Networked Intensive Care

Bibtex entry :

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@inproceedings { KSB+16,
  author = { K{"u}hn, Jan and Stollenwerk, André and Brendle,
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R{"u}dger },

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Software
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Edited by: Wolf Zimmermann, Lukas Alperowitz, Bernd
Br{"u}gge, J{"o}rn Fahsel, Andrea Herrmann, Anne Hoffmann,
Andreas Krall, Dieter Landes, Horst Lichter, Dirk Riehle,
Ina Schaefer, Constantin Scheuermann, Alexander Schlaefer,
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Stollenwerk, R{"u}diger Wei{\ss}bach] },
publisher = { RWTH Aachen },
pages = { 187-194 },
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cin = { 122810 / 120000 / 611010 / 9210120533000-2 },
url = { http://ceur-ws.org/Vol-1559/paper25.pdf },
illkey = { DFG project 224967929 - Kooperierende Regelung von
extrakorporaler Lungenunterst{"u}tzung und Beatmung f{"u}r
die Therapie des Lungenversagens (ECLA-VENT) (224967929) },
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[KVS+16]

[PDFBIB](#)

Kühn, J., Vaitl, L., Stollenwerk, A., Brendle, C., Walter, M., Leonhardt, S., Kowalewski, S., Rossaint, R., Kopp, R., and Janisch, T., "Eingebettete Rezirkulationsmessung für eine ECLA-Therapie", in *Proc. AUTOMED 2016 : Workshop : Wismar, 22.-23. September 2016 / DGBMT - Deutsche Gesellschaft für Biomedizinische Technik im VDE ; Editoren: Prof. Dr.-Ing. habil. Olaf Simanski, Dr. Olaf Hagendorf, Jörg Zucknik*, Wismar, 2016, Hochschule Wismar, Fakultät für Ingenieurwissenschaften, Fachgebiet Automatisierungstechnik/Mechatronik, p. 2.

Eingebettete Rezirkulationsmessung für eine ECLA-Therapie

Bibtex entry :

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@inproceedings { KVS+16,
author = { K{"u}hn, Jan and Vaitl, Lorenz and Stollenwerk, André
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[WBK+16]

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Bibtex entry :

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@inproceedings { WBK+16,
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[BHK+15]

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Brendle, C., Hackmack, K., Kühn, J., Wardeh, M. N., Kopp, R., Rossaint, R., Stollenwerk, A., Kowalewski, S., Misgeld, B. J. E., Leonhardt, S., and Walter, M., "In silico evaluation of gas transfer estimation during extracorporeal membrane oxygenation", *IFAC-PapersOnLine*, vol. 48, iss. 20, pp. 499-504, 2015

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  author = { Brendle, Christian and Hackmack, Kay-Florian and
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[KSB+15]

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Steffen and Wardeh, Markus Nabil and Kopp, R{"u}dger and
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[KSS+15]

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  author = { K{"u}hn, Jan and Schoonbrood, Pierre and Stollenwerk,
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[KWS+15]

[PDFBIB](#)

Kühn, J., Wübbels, N., Stollenwerk, A., Kowalewski, S., Brendle, C., Walter, M., Leonhardt, S., Wardeh, M., Kopp, R., and Roissant, R., "Pulsatile Ansteuerung einer Diagonalblutpumpe", in *Proc. Automation 2015 : 16. Branchentreff der Mess- und Automatisierungstechnik, 11. und 12. Juni 2015, Baden-Baden / VDI/VDE-Gesellschaft Mess- und Automatisierungstechnik*, Düsseldorf, 2015 in VDI-Berichte, VDI-Verl., pp. 325-339.

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Marian and Leonhardt, Steffen and Wardeh, Markus and Kopp,
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[SKW+15]

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Stollenwerk, A., Kühn, J., Walter, M., Brendle, C., Wardeh, M. N., Rossaint, R., Leonhardt, S., Kowalewski, S., and Kopp, R., "Software-based Prediction of Cannula Occlusion during Extracorporeal Blood Circulation through Networked Medical Data", in *Proc. SE-WS 2015, software engineering workshops 2015 : gemeinsamer Tagungsband der Workshops der Tagung Software Engineering 2015, Dresden, 17. - 18. März 2015 / hrsg. von Wolg Zimmermann ...*, Aachen, Germany, 2015 in CEUR workshop proceedings, RWTH Aachen, pp. 1-6.

Software-based Prediction of Cannula Occlusion during Extracorporeal Blood Circulation through Networked Medical Data

Bibtex entry :

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@inproceedings { SKW+15,
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[SKB+14]

[PDFBIB](#)

Stollenwerk, A., Kühn, J., Brendle, C., Walter, M., Arens, J., Wardeh, M. N., Kowalewski, S., and Kopp, R., "Model-based supervision of a blood pump", in *Proc. Proceedings of the 19th World Congress of the International Federation of Automatic Control, Cape Town, South Africa, 2014, 24-29 August 2014 : Promoting automatic control for the benefit of humankind*, Laxenburg, 2014 in IFAC-PapersOnLine, IFAC, pp. 6593-6598.

Model-based supervision of a blood pump

Bibtex entry :

```
@inproceedings { SKB+14,  
  author = { Stollenwerk, André and Kühn, Jan and Brendle,  
Christian  
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