

Simon Fonck, M.Sc. RWTH

Contact

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Office: 2325

Research

My research takes place within the ASIC use case of the [SMITH-project](#). This includes research on methods for ensuring data quality, modeling patient treatments, and early detection of ARDS. Current theses in these areas are advertised on the [Theses page](#). For more specific requests, I can be reached by email.

Office hours

By arrangement

Teaching

Term	Title	Type
Summer Term 23	Embedded Systems	VL
	seminar	S
	proseminar	S
Winter Term 22/23	seminar	S
	proseminar	S
Summer Term 22	Embedded Systems	VL
	seminar	S
	proseminar	S

Winter Term 21/22	seminar	S
	proseminar	S
Summer Term 21	Embedded Systems	VL
	seminar	S
	proseminar	S
Winter Term 20/21	seminar	S
	proseminar	S
Summer Term20	Embedded Systems	VL
	seminar	S
	proseminar	S
Winter Term 19/20	seminar	S
	proseminar	S

Supervised Theses

WS 23/24

- Erklärbarkeitsanalyse von Deep-Learning Modellen zur Erkennung von bilateralen Infiltraten in Röntgenbildern
 - (Master) Framework zur automatisierten ARDS-Erkennung basierend auf KI-gestützten Verfahren
- (Master) Comparison of White Box and Black Box Models in the Context of Artificial Intelligence for ARDS Classification
 - Few-Shot Learning für die Erkennung von bilateralen Infiltraten in Röntgenbildern

SS 23

- Evaluation der Robustheit von Deep Learning Methoden zur Klassifizierung von bilateralen Infiltraten in Thorax-Röntgenbilder
- Identifikation und Evaluation von Patientenclustern in intensivmedizinischen Datenbanken
- (Master) Active Learning for targeted data annotation and model training in intensive care data

WS 22/23

- (Master) Comparison of intensive care databases and transferability of AI-methods for the ARDS detection
- [Automatische Erkennung von bilateralen Infiltraten in Röntgenbildern mit Hilfe von Vision Transformern](#)
 - (Master) Novelty Detection using Deep Learning-based Methods in Intensive Care Data
 - (Master) An approach to explainable artificial intelligence in the context of medical care for ARDS patients
 - (Master) Detection of ARDS in time series clinical data using Deep Learning models

SS 22

- Entwurf eines Frameworks zur Bewertung der Datenqualität in intensivmedizinischen Datenbanken am Beispiel ARDS

- Optimierung von Deep-Learning Modellen zur automatischen Erkennung von akutem Lungenversagen in Röntgenbildern
 - Retrospektive Erkennung von ARDS mit Hilfe von Random-Forest Algorithmen
 - Retrospektive Erkennung von ARDS mit Hilfe einer Support Vector Machine

WS 21/22

- (Master) Automatische Erkennung von bilateralen Infiltraten in Thoraxröntgenbildern mit Hilfe von Machine Learning

SS 21

- (Master) Data imputation & Data correction in Intensive Care Physiological Data
- Retrospektive Klassifizierung von ARDS-Verläufen in intensivmedizinischen Sekundärdaten

WS 20/21

- (Master) Interaktives Analysesystem für die algorithmische Novelty Detection in intensivmedizinischen Datensätzen
 - (Master) Konstruktion eines Bayesschen Netzes zur Erkennung von ARDS
 - Implementierung und Modellierung einer exemplarischen FHIR-Schnittstelle
- Transformation heterogener intensivmedizinische Datenbanken in das OMOP-CDM
- Erweiterung einer modellbasierten Klassifikation von ARDS-Patienten um physiologische Zusammenhänge

SS 20

- Erkennung von Sensorfehlern in intensivmedizinischen Datensätzen mithilfe von Novelty Detection
- Implementierung einer Diagnoseunterstützung auf Basis symptomatischer Zusammenhänge

WS 19/20

- Algorithmische Plausibilitätsprüfung intensivmedizinischer Patientendaten
- Implementierung einer modellbasierten Klassifikation von ARDS-Patienten

Publications

[FFN+23]

[PDFBIB](#)

Fonck, S. A. M., Fritsch, S., Nottenkämper, G., and Stollenwerk, A., "Implementation of ResNet-50 for the Detection of ARDS in Chest X-Rays using transfer-learning", *Proceedings on automation in medical engineering*, vol. 2, iss. 1, p. 2, 2023

Implementation of ResNet-50 for the Detection of ARDS in Chest X-Rays using transfer-learning

Bibtex entry :

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@article { FFN+23,
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author = { Fonck, Simon Ansgar Martin and Fritsch, Sebastian and  
Nottenk{\a}mper, Gina and Stollenwerk, André },  
title = { Implementation of ResNet-50 for the Detection of ARDS in  
Chest X-Rays using transfer-learning },  
journal = { Proceedings on automation in medical engineering },  
publisher = { Infinite Science GmbH },  
pages = { 2 Seiten },  
volume = { 2 },  
number = { 1 },  
year = { 2023 },  
address = { L{\u}beck },  
organization = { 16. Interdisziplin{\a}res Symposium AUTOMED -  
Automatisierungstechnische Verfahren f{\u}r die  
Medizintechnik, Gie{\ss}en (Germany), 2023-03-30 -  
2023-03-31 },  
doi = { 10.18154/RWTH-2023-03291 },  
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cin = { 122810 / 120000533000-3 / 931210 },  
url = { https://doi.org/10.18416/AUTOMED.2023 },  
}
```

[FFK+21]

[PDFBIB](#)

Fonck, S., Fritsch, S. J., Kowalewski, S., Hensen, R., and Stollenwerk, A., "Algorithmic distinction of ARDS and Heart Failure in ICU data from medical embedded systems by using a computer model", *IFAC-PapersOnLine*, vol. 54, iss. 4, pp. 135-140, 2021

Algorithmic distinction of ARDS and Heart Failure in ICU data from medical embedded systems by using a computer model

Bibtex entry :

```
@article { FFK+21,  
author = { Fonck, Simon and Fritsch, Sebastian Johannes and  
Kowalewski,  
Stefan and Hensen, Raimund and Stollenwerk, André },  
title = { Algorithmic distinction of ARDS and Heart Failure in ICU  
data from medical embedded systems by using a computer model },  
journal = { IFAC-PapersOnLine },  
publisher = { Elsevier },  
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volume = { 54 },  
number = { 4 },  
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issn = { 2405-8963 },  
organization = { 4. IFAC Conference on Embedded Systems,
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Computational

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Intelligence and Telematics in Control, Valenciennes
(France), 2021-07-05 - 2021-07-07 },
doi = { 10.1016/j.ifacol.2021.10.023 },
typ = { PUB:(DE-HGF)16 },
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cin = { 122810 / 120000533000-2533000-2 },
url = {
http://publications.rwth-aachen.de/record/834987/files/834987.pdf },
illkey = { SMITH - Medizininformatik-Konsortium (BMBF-01ZZ1803K) },
}

```

[MBF+21]

[PDFBIB](#)

Marx, G., Bickenbach, J., Fritsch, S. J., Kunze, J. B., Maassen, O., Deffge, S., Kistermann, J., Haferkamp, S. D., Lutz, I., Voellm, N. K., Lowitsch, V., Polzin, R., Sharafutdinov, K., Mayer, H., Kuepfer, L., Burghaus, R., Schmitt, W., Lippert, J., Riedel, M., Barakat, C., Stollenwerk, A., Fonck, S., Putensen, C., Zenker, S., Erdfelder, F., Grigutsch, D., Kram, R., Beyer, S., Kampe, K., Gewehr, J. E., Salman, F., Juers, P., Kluge, S., Tiller, D., Wisotzki, E., Gross, S., Homeister, L., Bloos, F., Scherag, A., Ammon, D., Mueller, S., Palm, J., Simon, P., Jahn, N., Loeffler, M., Wendt, T., Schuerholz, T., Groeber, P., and Schuppert, A., "Algorithmic surveillance of ICU patients with acute respiratory distress syndrome (ASIC) : protocol for a multicentre stepped-wedge cluster randomised quality improvement strategy", *BMJ open*, vol. 11, iss. 4, pp. 1-7, 2021

Algorithmic surveillance of ICU patients with acute respiratory distress syndrome (ASIC) : protocol for a multicentre stepped-wedge cluster randomised quality improvement strategy

Bibtex entry :

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@article { MBF+21,
  author = { Marx, Gernot and Bickenbach, Johannes and Fritsch,
Sebastian
Johannes and Kunze, Julian Benedict and Maassen, Oliver and
Deffge, Saskia and Kistermann, Jennifer and Haferkamp, Silke
Dorothee and Lutz, Irina and Voellm, Nora Kristiana and
Lowitsch, Volker and Polzin, Richard and Sharafutdinov,
Konstantin and Mayer, Hannah and Kuepfer, Lars and Burghaus,
Rolf and Schmitt, Walter and Lippert, Joerg and Riedel,
Morris and Barakat, Chadi and Stollenwerk, André and Fonck,
Simon and Putensen, Christian and Zenker, Sven and
Erdfelder, Felix and Grigutsch, Daniel and Kram, Rainer and
Beyer, Susanne and Kampe, Knut and Gewehr, Jan Erik and
Salman, Friederike and Juers, Patrick and Kluge, Stefan and
Tiller, Daniel and Wisotzki, Emilia and Gross, Sebastian and
Homeister, Lorenz and Bloos, Frank and Scherag, André and
Ammon, Danny and Mueller, Susanne and Palm, Julia and Simon,
Philipp and Jahn, Nora and Loeffler, Markus and Wendt,

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Thomas and Schuerholz, Tobias and Groeber, Petra and
Schuppert, Andreas },
title = { Algorithmic surveillance of ICU patients with acute
respiratory distress syndrome (ASIC) : protocol for a
multicentre stepped-wedge cluster randomised quality
improvement strategy },
journal = { BMJ open },
publisher = { BMJ Publishing Group },
pages = { 1-7 },
volume = { 11 },
number = { 4 },
year = { 2021 },
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issn = { 2044-6055 },
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url = {
http://publications.rwth-aachen.de/record/817136/files/817136.pdf },
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}
```

[FD17]

[PDFBIB](#)

Fonck, S. A. M. and Deserno, T., "Modeling an IT Support for Handling Serious Adverse Events in Clinical Trials", in *Proc. MEDINFO 2017 : precision healthcare through informatics : proceedings of the 16th World Congress on Medical and Health Informatics / edited by Adi V. Gundlapalli (University of Utah/VA Salt Lake City Health Care System), Marie-Christine Jaulent (DR Inserm) and Dongsheng Zhao (Academy of Military Medical Science of China)*, Amsterdam, 2017 in *Studies in health technology and informatics*, IOS Press, pp. 1262-1262.

Modeling an IT Support for Handling Serious Adverse Events in Clinical Trials

Bibtex entry :

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@inproceedings { FD17,
  author = { Fonck, Simon Ansgar Martin and Deserno, Thomas },
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  booktitle = { MEDINFO 2017 : precision healthcare through
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proceedings of the 16th World Congress on Medical and Health
Informatics / edited by Adi V. Gundlapalli (University of
Utah/VA Salt Lake City Health Care System), Marie-Christine
Jaulent (DR Inserm) and Dongsheng Zhao (Academy of Military
Medical Science of China) },
  publisher = { IOS Press },
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Informatics,
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url = {
http://publications.rwth-aachen.de/record/716886/files/716886.pdf },
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<https://www.embedded.rwth-aachen.de/doku.php?id=en:lehrstuhl:mitarbeiter:fonck>

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