

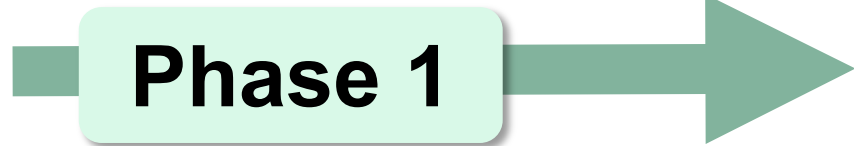
RACOON

Die Radiologie Kooperation im NUM

Malte Maria Sieren

Universitätsklinikum Schleswig-Holstein, Campus Lübeck





„Kliniken vernetzen sich in der Krise“

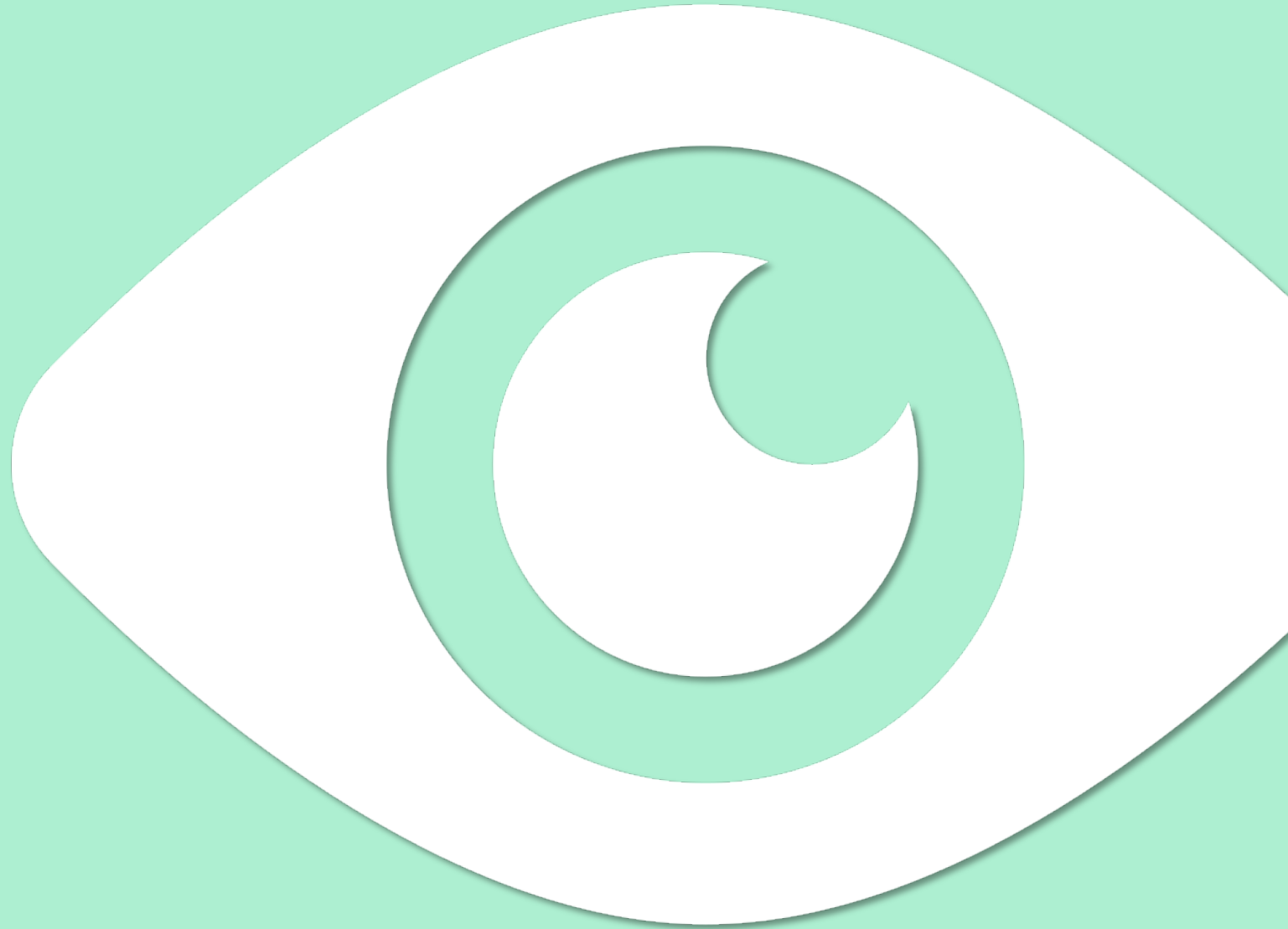
2021

2022

2023

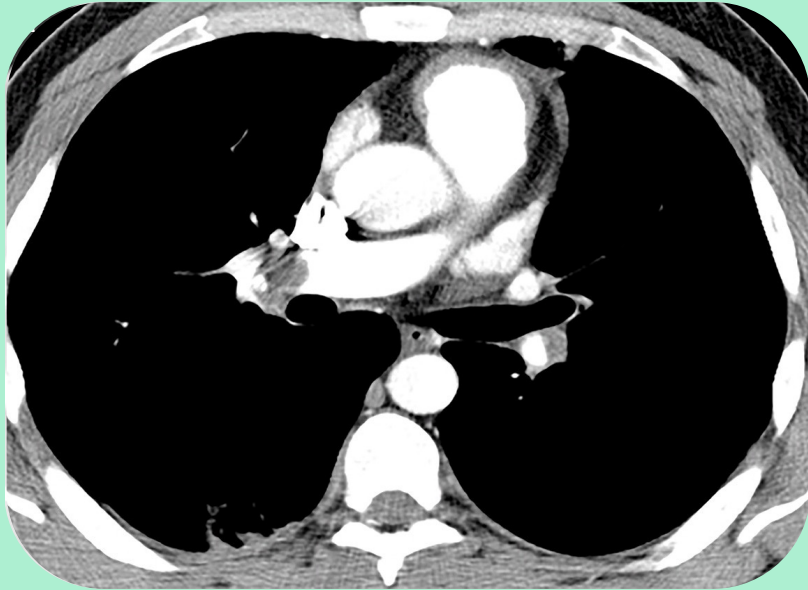
2024

Phase 1



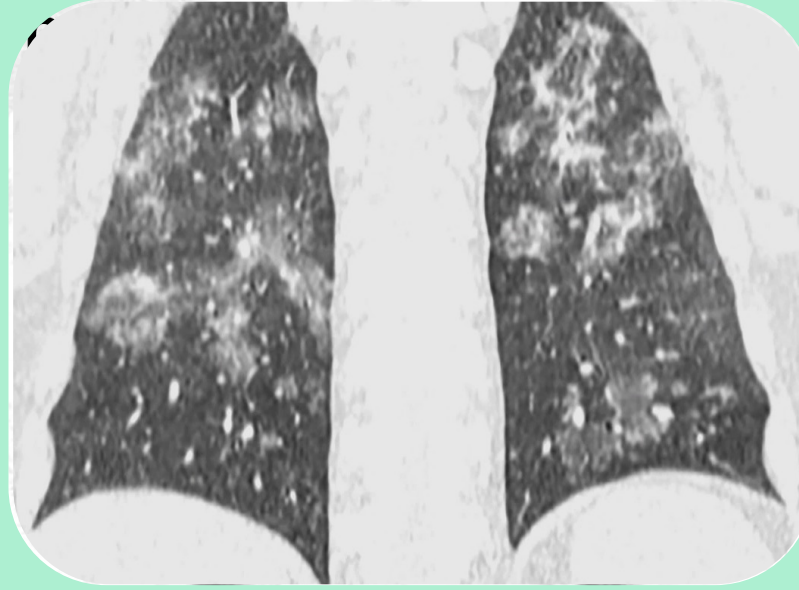
Radiologie
– das Auge in der Pandemie

Die radiologische Sicht – und Antwort



Lungenembolie

Therapie: Blutverdünnung



Paracoccidioidomycose

Therapie: Pilzmedikation



Schwerer COVID-19 Befall

Therapie: Intensivbehandlung

Die RACOON Idee

Deutschlandweites Netzwerk für Bildgebungsforschung

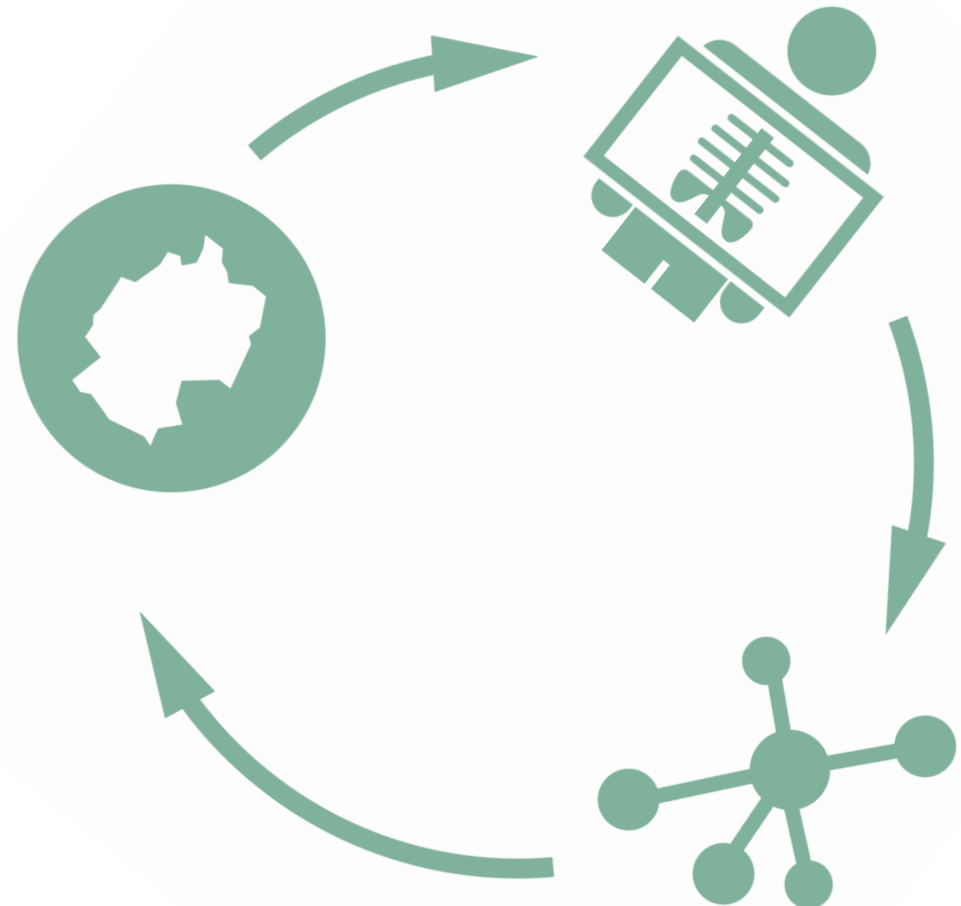
Bildgebung ist bei neuartigen Erkrankungen **universell einsetzbar**

Radiologische Befundbewertung prinzipiell **subjektiv**

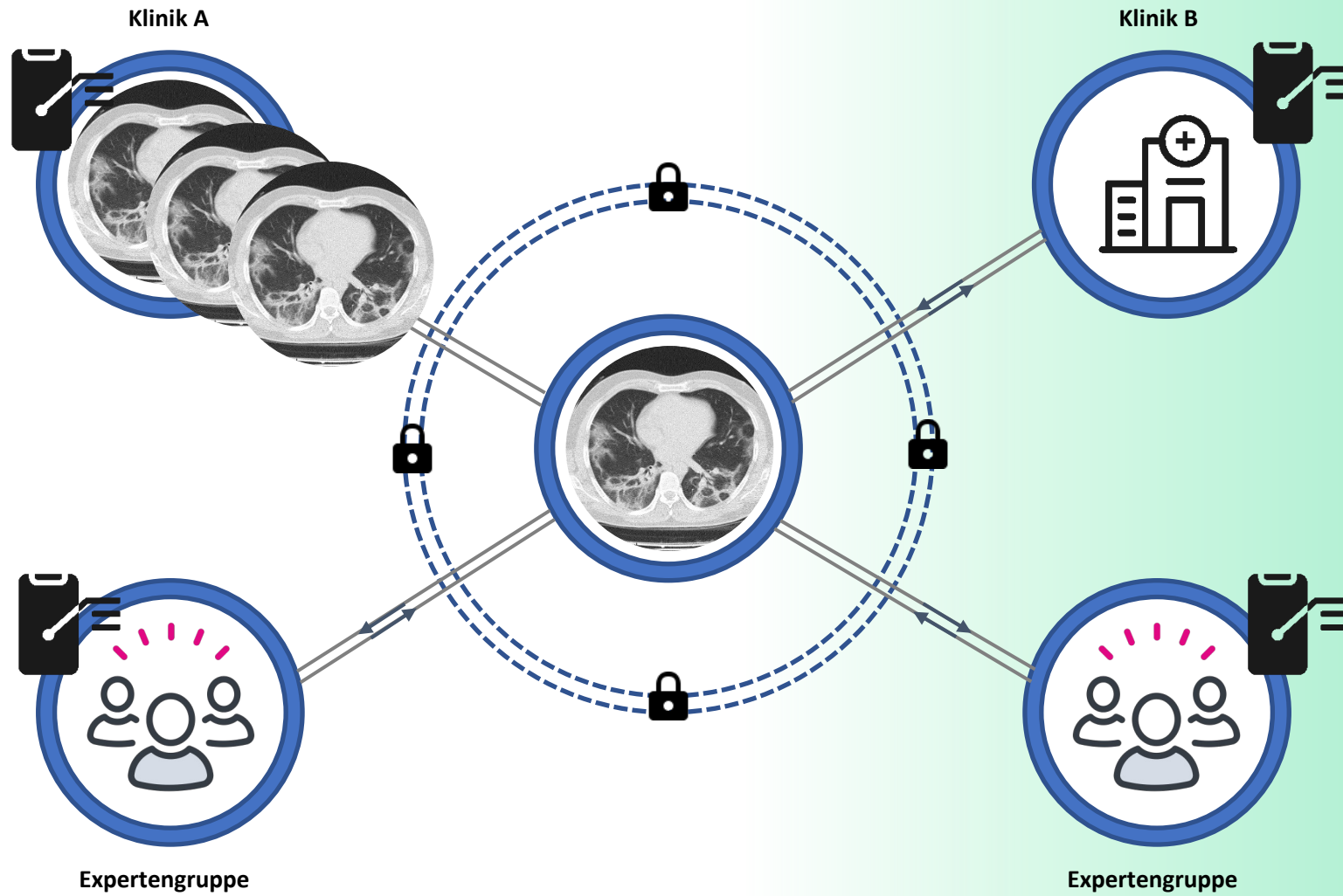
Wertschöpfung durch KI nur mit **strukturierter Erhebung** möglich

Kollaborative Forschung auf Bilddaten **erfordert eigene Infrastrukturen**

→ RACOON: Schaffung eines **gemeinsamen Ökosystems** für **hochstrukturierte Datenerhebung**



Infrastruktur für Datenaustausch



Infrastruktur



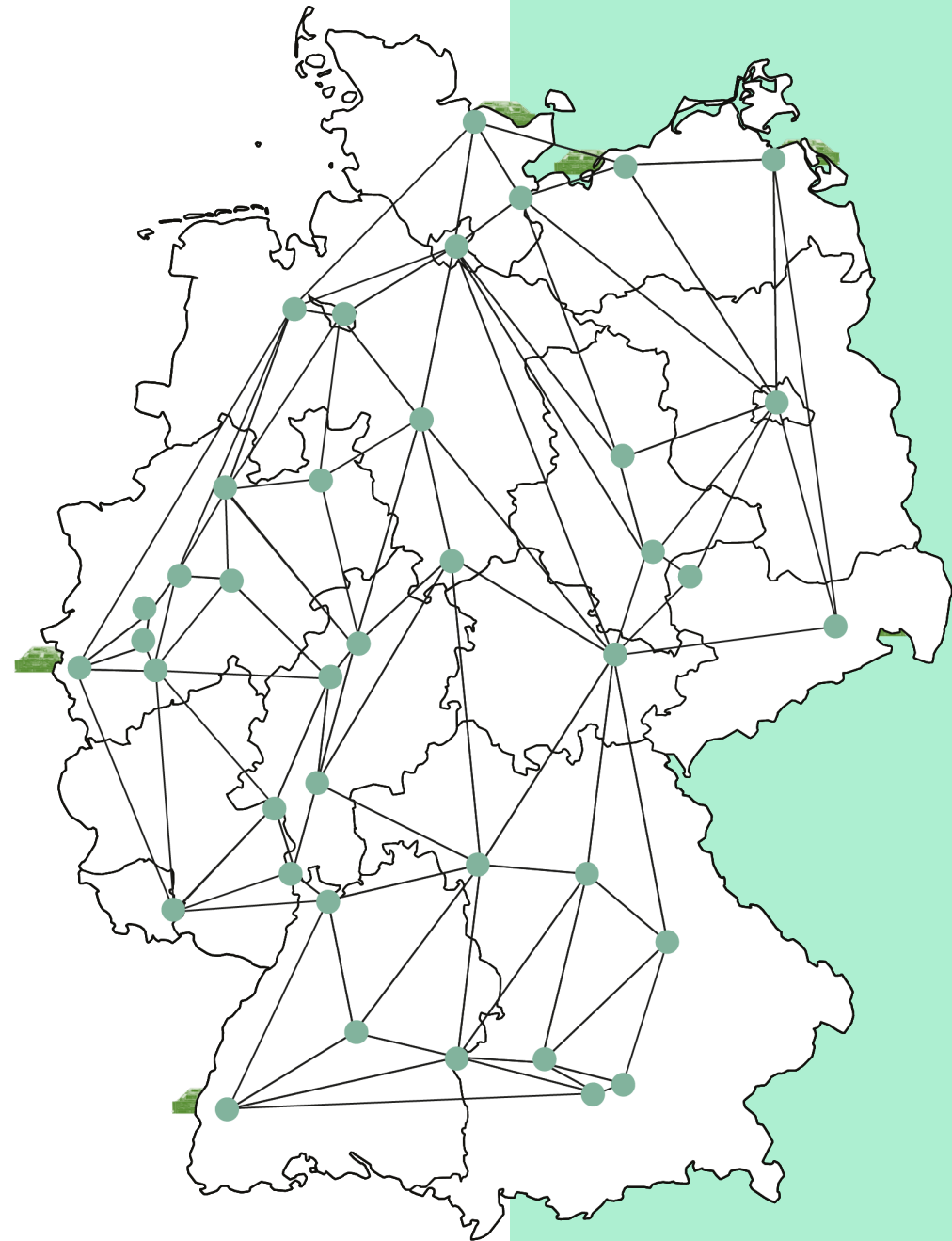
Serverinfrastruktur

RACOON-Server
dezentrale, nationale Infrastruktur

RACOON-Central
Orchestrierung und Monitoring

RACOON-Softwarekomponenten
Datenanalyse und KI-Anwendung

→ **Weltweit erstmalige
Struktur dieser Art**



RACCOON : Regularien

Komplexe datenschutzrechtliche Anforderungen:

Partner in 15 Bundesländern

Föderale Regelungen entsprechend DSGVO
und Landeskrankenhausrecht

- Abgestimmtes aktualisiertes
Datenschutzpaket (200+ Seiten)
- Abgestimmte **Datenschutzvertrag**
mit allen UK-Standorten

Prozess zur Prüfung von Subprojekten im
Netzwerkverbund

Ethikantrag
Phase 1

Ethikantrag Addendi

Datenschutz-Dokumentationspakete

Vertragliche Grundlage: gemeinsame
Datenschutz-Verantwortung

Weiterleitungsvertrag NUM

ukb universitäts
klinikumbonn

KRI
Klinikum rechts der Isar
Technische Universität München

Uniklinikum
Würzburg **UK**

**UNIVERSITÄT
BIELEFELD**



Universitätsklinikum Essen

**Universitätsmedizin
GREIFSWALD**

UKS
Universitätsklinikum
des Saarlandes



UMM
UNIVERSITÄTSMEDIZIN
MANNHEIM

UKR
Universitätsklinikum
Regensburg

Universitätsklinikum
Erlangen **+**

CHARITÉ
UNIVERSITÄTSMEDIZIN BERLIN

**UNIVERSITÄTS
KLINIKUM FRANKFURT**
GOETHE-UNIVERSITÄT

UK RUB UNIVERSITÄTSKLINIKUM DER
RUHR-UNIVERSITÄT BOCHUM

UKGM
UNIVERSITÄTSKLINIKUM
GIESSEN UND MARBURG

Universitätsklinikum
Carl Gustav Carus
DIE DRESDNER.

**Universitätsmedizin
Rostock**

**UK
SH** UNIVERSITÄTSKLINIKUM
Schleswig-Holstein

U UNIVERSITÄTS
KLINIKUM
ulm

**UNIKLINIK
RWTHAACHEN**



UNIVERSITÄTSMEDIZIN
GÖTTINGEN **UMG**

**UNIVERSITÄTS
KLINIKUM
jena**

UKH
Universitätsklinikum
Halle (Saale)

**UNIKLINIK
KÖLN**

LMU KLINIKUM
München

IGU UNIVERSITÄTSMEDIZIN.
MAINZ

UKD Universitätsklinikum
Düsseldorf

**Universitätsklinikum
Tübingen**

UKM
Universitätsklinikum
Münster

UKE
HAMBURG

**KLINIKUM
OLDENBURG**
Universitätsmedizin
Oldenburg

MHH
Medizinische Hochschule
Hannover

**Universitätsklinikum
Leipzig**
Anstalt öffentlichen Rechts

KLINIKUM AUGSBURG

dkfz. DEUTSCHES
KREBSFORSCHUNGSZENTRUM
IN DER HELMHOLTZ-GEMEINSCHAFT



RACOON
Die Radiologie
Kooperation
im NUM

ImFusion

**Fraunhofer
MEVIS**

**mint[®]
medical**

Universitätsmedizin Essen
Institut für KI in der Medizin (IKIM)

**TECHNISCHE
UNIVERSITÄT
DARMSTADT**

netzwerk
universitäts
medizin

GEFÖRDERT VOM
**Bundesministerium
für Bildung
und Forschung**

Das RACOON Konsortium

38 Universitäre, radiologische Institute

+ Neuroradiologien

+ pädiatrische Radiologien

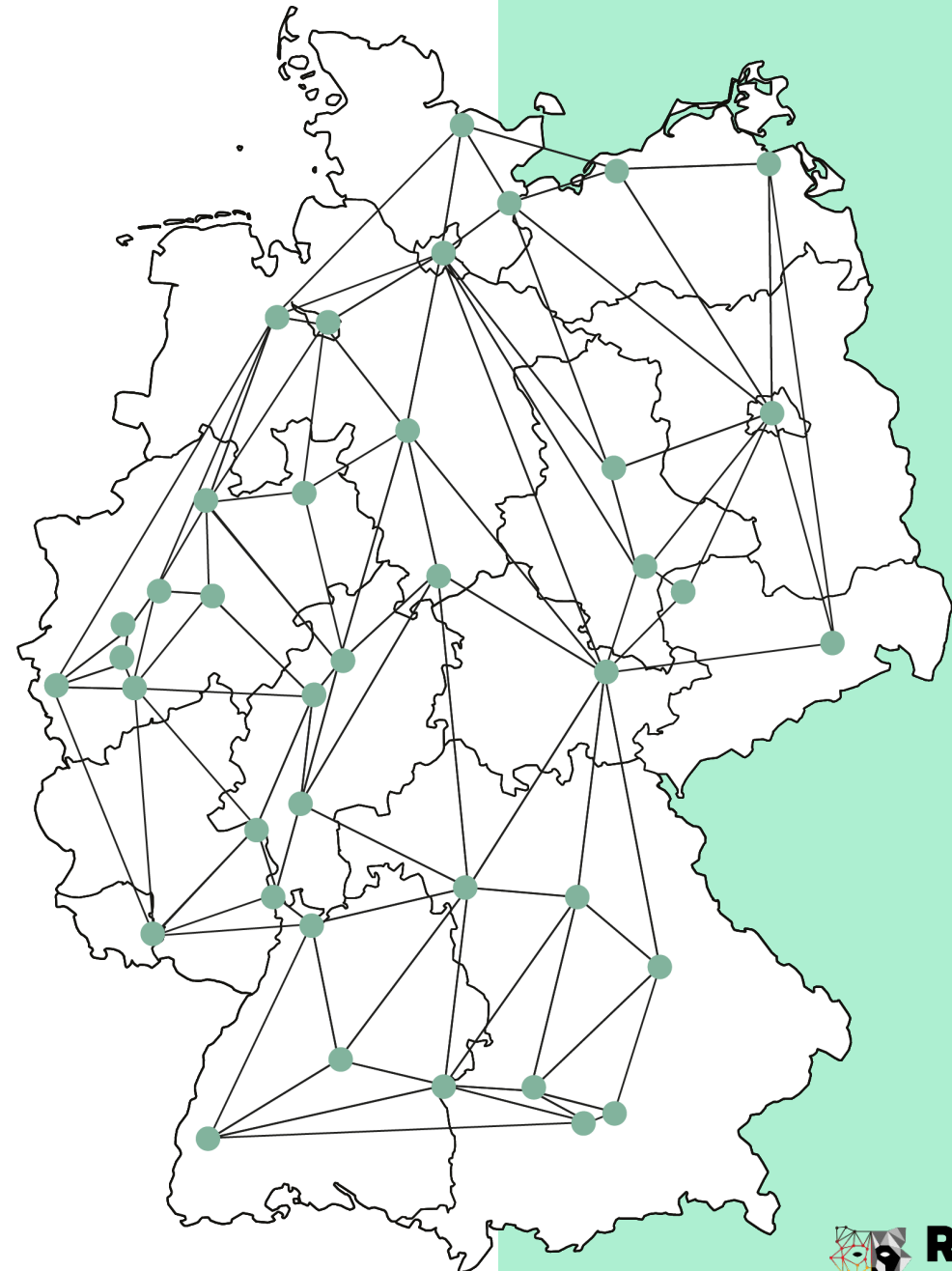
+ Standortinformatiker

Etablierte, wissenschaftliche Partner

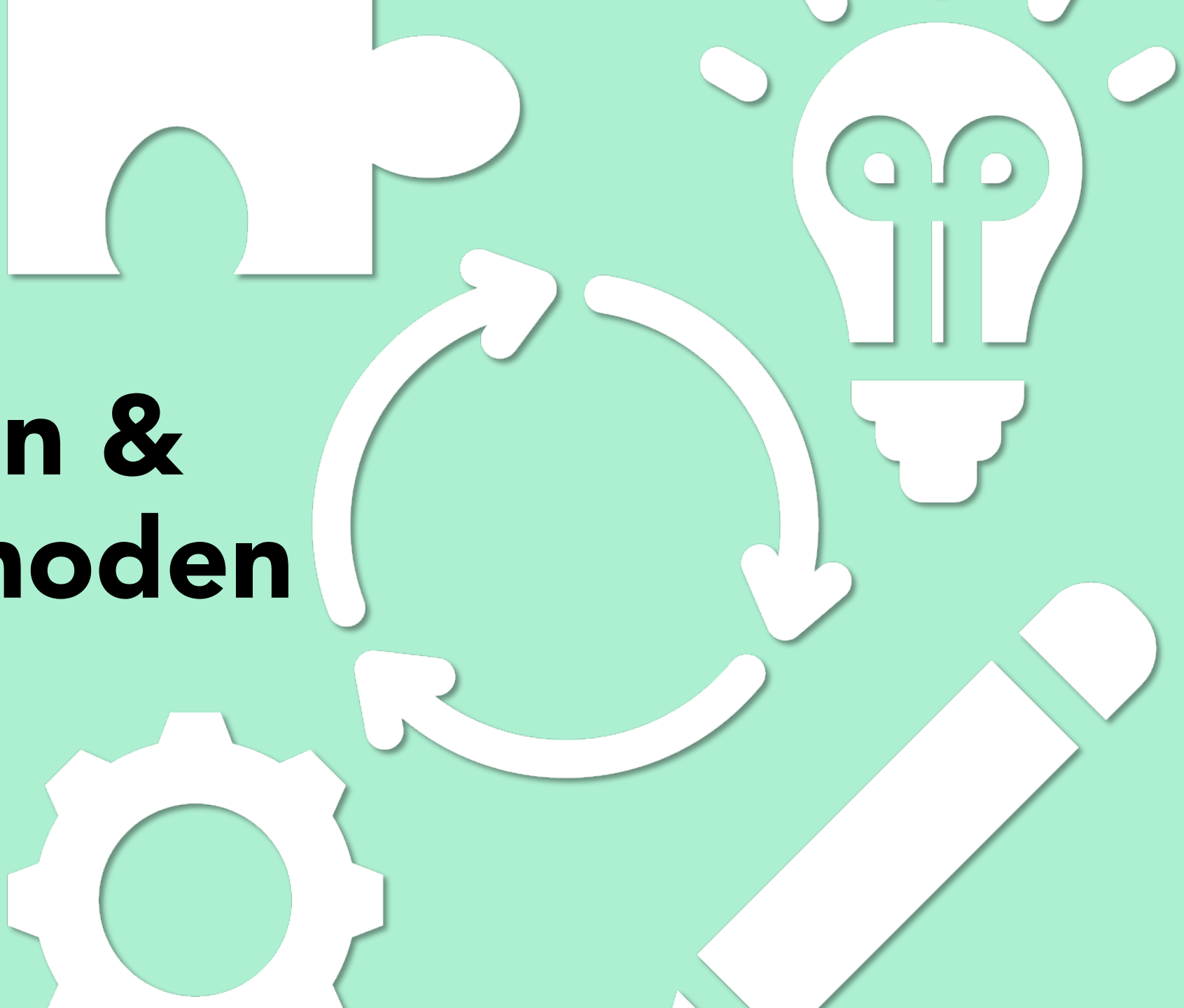
- German Cancer Research Center (DKFZ)
- Fraunhofer Mevis
- Technical University of Darmstadt

Industriepartner

- Mint Medical
- IMFusion



Daten & Methoden



RACoon-Kohorte

Repräsentative Kohorte für Lungenerkrankungen

- COVID-19 und ähnliche Erkrankungen
- Chronische Grunderkrankungen
- Tumorerkrankungen
- Normale Kontrollfälle

Standort-, Protokoll-, Hersteller- und Pathologieübergreifend



RACCOON: Datenerhebung

Dynamische Erhebungsmaske

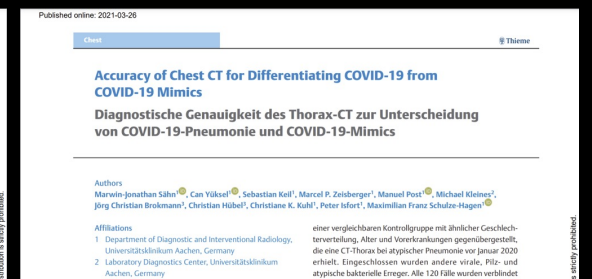
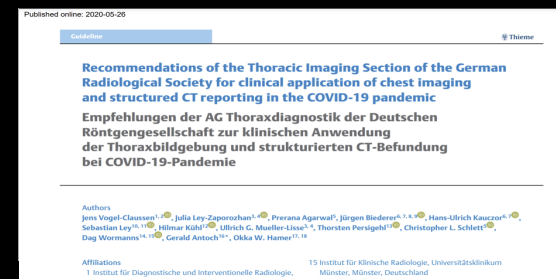
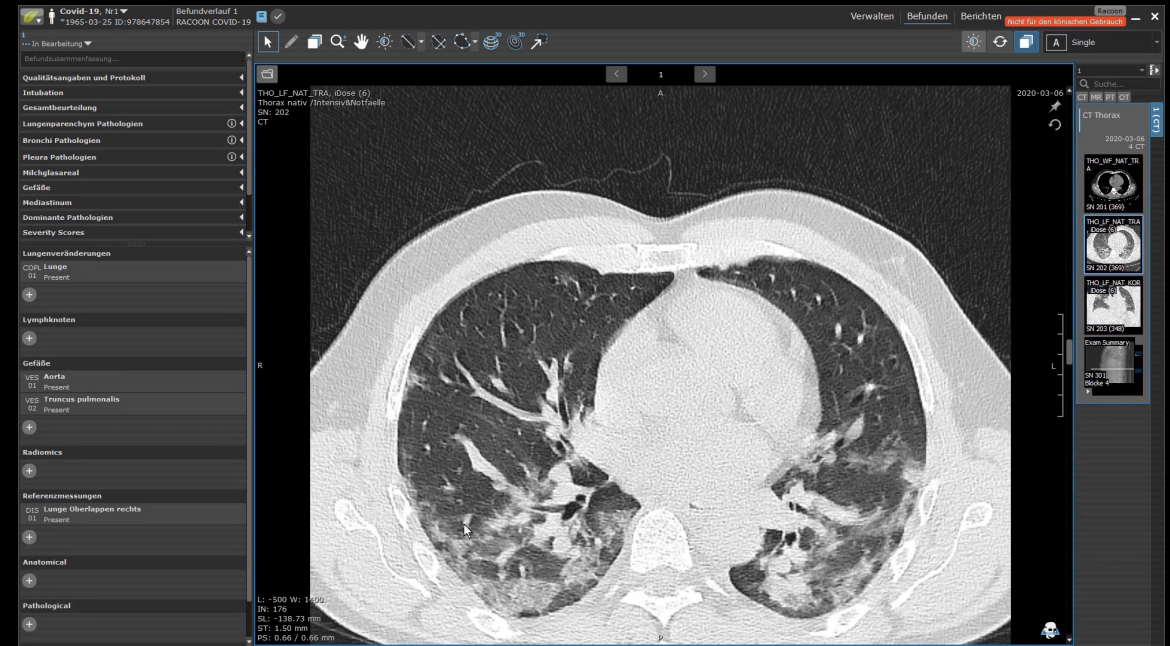
Internationale Standards

463+ strukturierte Items
(6,667,200 für CT)

Anatomische und pathologische
Veränderungen

Komplementäre klinische
Information

- Diagnosen
- Laborparameter
- Outcome



Segmentierung

RACON Lung Analysis Platform Not for clinical use! Subject: Covidfall 005 **Shared Session**

Workflow: **Reading**

Finish Reading

Lung Segmentation
Please create a segmentation of the left and right lung.
[Reset](#) [Run Lung AI](#)

- Lung Lobes
- Bronchi & Vessels
- Findings
- Analysis

Structures

Lung Segmentation

- Right lung Not yet created.
- Left lung Not yet created.

Screenshot Gallery

Help Box

2D Seg Compare 2D+3D 3D

Covidfall 005 (- - -): GV **A** CT

200 mm

Slice: 206 LUT C/W: -500.000 / 1500.000

Covidfall 005 (- - -): GV **H** CT

100 mm

Slice: 256 LUT C/W: -500.000 / 1500.000

Covidfall 005 (- - -): GV **H** CT

100 mm

Slice: 256 LUT C/W: -500.000 / 1500.000

Standardisierung & Teaching

Bildbasierter Befundungsatalas

Expertenworkshops

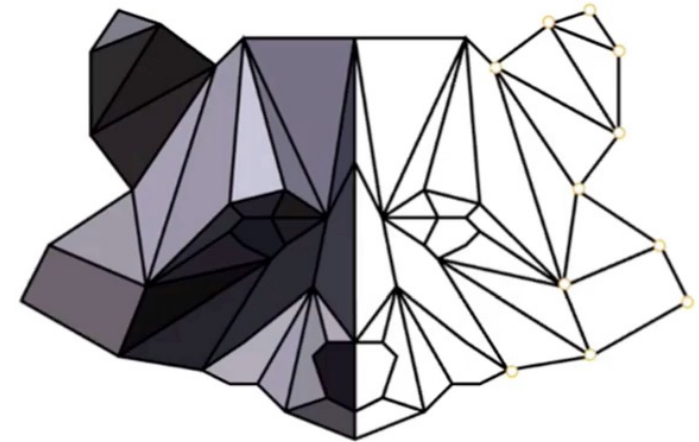
- Befundung
- Komplementäre Datenerhebung
- Segmentierung

Qualitätskontrollstudie

- Alle Befunder werden geschult und kontrolliert
- Instant feedback

RACOON-Atlas

(v1.1 2020-02-04)





2.623

Thoraxröntgen

272.792

Datenitems
Thoraxröntgen

14.023

Computertomographien

6.492.649

Datenitems
Computertomographie

2.728

Lungensegmentierungen
CT

32.214

Annotierte ROIs
CT

2.285.749

Datenitems
Klinischer Parameter

 369

Projektbeteiligte

 129

Befundende
Radiologen

 108

Bildsegmentierer

 62

Dokumentierer

 56

Proposals für Subprojekte



RACOON im Netzwerk

RAC

- 1. Lokales
- 2. Multi-centrisches

ARTICLE OPEN

A reporting and analysis framework for COVID-19 clinical and imaging data

Gabriel Alexander Salg^{1,18}, Maria-Katharina Ganten^{1,18}, And Matthias Alexander Fink³, Constantin Seibold⁴, Ricarda Elis Philipp Fervers⁵, Felix Doellinger⁶, Anna Luger⁹, Saif Afat¹⁰, Tobias Penzkofer^{11,13}, Thorsten Persigehl⁷, Ahmed Othman¹², Konstantinos Stathopoulos¹⁵, Bernd Hamm⁸, Thomas J. Vogl^{16,17,23}, Jens Kleesiek^{16,17,23}

The COVID-19 pandemic has worldwide individual and societal impact. This work introduces an approach to support diagnostics and disease monitoring. A star

Bone 144 (2021) 115790

Contents lists available at ScienceDirect

Bone

journal homepage: www.elsevier.com/locate/bone

Full Length Article
Early extrapulmonary prognostic features in chest computed tomography in COVID-19 pneumonia: Bone mineral density is a relevant predictor for the clinical outcome - A multicenter feasibility study*

Jonathan Kottlors^{1,2}, Nils Große Hokamp³, Philipp Fervers⁴, Johannes Bremm⁵, Florian Fichter⁶, Thorsten Persigehl⁷, Orkhan Safarov¹, David Maintz⁸, Stephanie Tritt⁹, Nuran Abdullayev⁸

¹Institute of Diagnostic and Interventional Radiology, University Hospital of Cologne, Germany
²Helios Dr. Horst Schmidt Kliniken Wiesbaden, Germany

Contents lists available at ScienceDirect

European Journal of Radiology

journal homepage: www.elsevier.com/locate/ejrad

Research article
Body composition on low dose chest CT is a significant predictor for clinical outcome in COVID-19 disease - A multicenter feasibility study

Jonathan Kottlors^{1,2}, David Zopfs³, Philipp Fervers⁴, Johannes Bremm⁵, David Maintz⁸, Stephanie Tritt⁹, Thorsten Persigehl⁷

¹Institute of Diagnostic and Interventional Radiology, University Hospital of Cologne, Germany
²Helios Dr. Horst Schmidt Kliniken Wiesbaden, Germany

ARTICLE INFO ABSTRACT

Keywords: Obesity, Body composition, Low-dose computed tomography, COVID-19

Purpose: Low-dose computed tomography (CT) is a recommended diagnostic tool for early detection and quantification of COVID-19 pneumonia caused by the novel corona virus. Demographic factors, especially age and sex, are major determinants of the outcome in COVID-19 infection. This study examined the impact of body composition on the clinical outcome in COVID-19 pneumonia. **Methods:** We analyzed 58 PCR-confirmed COVID-19 infections that received an intensive care unit (ICU) treatment. In addition to the extent of pulmonary involvement, we assessed the body composition of thoracic vertebrae 9–12. **Results:** In a univariate regression analysis BMD was found to be a significant predictor for clinical outcome. In the subgroup requiring intensive care unit treatment of COVID-19 patients. In the subgroup requiring intensive care unit treatment of COVID-19 patients. In the subgroup requiring intensive care unit treatment of COVID-19 patients. **Conclusion:** FMR as potential surrogate for body composition is a significant predictor for clinical outcome in COVID-19 pneumonia. Within the multivariate logistic regression model considering gender, age and CT measured density, BMD was eliminated from the regression analysis as a significant predictor. **Conclusion:** Phantomless assessed BMD provides prognostic information on the course of COVID-19 pneumonia. We recommend using the measurement of BMD to facilitate a potentially better prediction of severe patient outcomes within the 22 days of follow-up period. In the present sample, additional body density analysis did not result in a significantly larger patient cohort with a more homogeneous patient population. **Clinical relevance:** While clinical capacities such as ICU beds and ventilators are more limited in the current global corona pandemic, this work introduces an approach that is effective way to help determine the amount of these rare clinical resources required in the near future.

1. Introduction

Coronavirus disease (COVID-19) has been identified as an outbreak of severe acute respiratory syndrome in Wuhan, Hubei Province, China in the beginning of December 2019. It is caused due to a highly pathogenic human coronavirus, actually named severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2).

Berichtet wird über 50 Patienten, die im Zeitraum von März bis April 2020 ambulant untersucht wurden. Das Kollektiv umfasst 26 Männer und 24 Frauen. Die Patienten waren zwischen 23 und 89 Jahre alt, im Mittel 61,4 Jahre.

Ambulante Praxispatienten

Beteiligt waren 5 ambulante radiologische Praxen in Baden-Württemberg (Karlsruhe, Tübingen und Baden-Baden) und in Nordrhein-Westfalen (Würse-

ABSTRACT

Background: Besides throat-nose swab polymerase chain reaction (PCR), unenhanced CT is a recommended diagnostic tool for early detection and quantification of COVID-19 pneumonia caused by the novel corona virus. Demographic factors, especially age and sex, are major determinants of the outcome in COVID-19 infection. This study examined the impact of body composition on the clinical outcome in COVID-19 pneumonia. **Methods:** We analyzed 58 PCR-confirmed COVID-19 infections that received an intensive care unit (ICU) treatment. In addition to the extent of pulmonary involvement, we assessed the body composition of thoracic vertebrae 9–12. **Results:** In a univariate regression analysis BMD was found to be a significant predictor for clinical outcome. In the subgroup requiring intensive care unit treatment of COVID-19 patients. In the subgroup requiring intensive care unit treatment of COVID-19 patients. **Conclusion:** FMR as potential surrogate for body composition is a significant predictor for clinical outcome in COVID-19 pneumonia. Within the multivariate logistic regression model considering gender, age and CT measured density, BMD was eliminated from the regression analysis as a significant predictor. **Conclusion:** Phantomless assessed BMD provides prognostic information on the course of COVID-19 pneumonia. We recommend using the measurement of BMD to facilitate a potentially better prediction of severe patient outcomes within the 22 days of follow-up period. In the present sample, additional body density analysis did not result in a significantly larger patient cohort with a more homogeneous patient population. **Clinical relevance:** While clinical capacities such as ICU beds and ventilators are more limited in the current global corona pandemic, this work introduces an approach that is effective way to help determine the amount of these rare clinical resources required in the near future.

Information is generally spread over several informants for data generation, storage, and reporting. Finally, information of most meaningful diagnostic tests and references subject to frequent change, with a high volume of new findings. This means on the one hand that intensified ward evidence-based clinical diagnosis and treatment and reliable monitoring are essential. On the other hand, in

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JCO Clinical Cancer Informatics > List of Issues > Volume 4 >

ORIGINAL REPORTS | Artificial Intelligence

Joint Imaging Platform for Federated Clinical Data Analytics

Check for updates

Jonas Scherer¹, MS^{1,3}; Marco Nolden¹, PhD^{1,3,4}; Jens Kleesiek, MD, PhD^{3,5}; Jasmin Metzger, DiplInformMed^{1,3}; Klaus Kades, MSc^{1,3}; Verena Schneider^{3,5}, ...

Show More

Abstract Full Text PDF Figures and Tables Supplements

PURPOSE

Image analysis is one of the most promising applications of artificial intelligence (AI) in health care, potentially improving prediction, diagnosis, and treatment of diseases. Although scientific advances in this area critically depend on the accessibility of large-volume and high-quality data, sharing data between institutions faces various ethical and legal constraints as well as organizational and technical obstacles.

METHODS

The Joint Imaging Platform (JIP) of the German Cancer Consortium (DKTK) addresses these issues by providing federated data analysis technology in a secure and compliant way. Using the JIP, medical image data remain in the originator institutions, but analysis and AI algorithms are shared and jointly

OPTIONS & TOOLS

- Export Citation
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- Add To Favorites
- Purchase
- Rights & Permissions

COMPANION ARTICLES

No companion articles

ARTICLE CITATION

DOI: 10.1200/JCO.20.00045 JCO Clinical Cancer Informatics no. 4 (2020) 1027-1038. Published online November 9, 2020.

PMID: 33166197

WE RECOMMEND

Provider Engagement in Radiation Oncology Data Science: Workshop Report Arshu K. Jain et al., JCO CCI, 2020
An Architecture for Translational Cancer

„Lufnot“ ins Krankenhaus eingewiesen werden, ist von vornherein mit einer hohen Zahl an Lungenentzündungen zu rechnen.

Antikörperpestung, typischer Anamnese (z. B. enger Kontakt zu Infizierten) sowie durch typische Merkmale in der durchgeführten CT-Bildgebung.

RESEARCH ARTICLE

Calcification of the thoracic aorta on low-dose chest CT predicts severe COVID-19

Johannes Bremm¹, Nuran Abdullayev¹, Thorsten Persigehl¹, ...

Department of Radiology, Helios Dr. Horst Schmidt

Health Policy and Evidence-Based Medicine

Impact of the COVID-19 Pandemic on Radiology in Inpatient and Outpatient Care in Germany: A Nationwide Survey Regarding the First and Second Wave

Auswirkungen der COVID-19-Pandemie auf die radiologische Versorgung im stationären und ambulanten Bereich in Deutschland: Eine bundesweite Umfrage bezüglich der ersten und zweiten Welle

Authors: Simon Bernatz, Saif Afat, Ahmed E. Othman, Konstantin Nikolaou, Malte Sieren, Marwin-Jonathan Säher, Daniel Pinto dos Santos, Tobias Penzkofer, Andreas Michael Bucher, Bernd Hamm, Thomas J. Vogl, Boris Bodelfi, Alexander Gussev, Alexander König, Alexey Surov, Andreas Bucher, Andreas Mahken, Arno Bücker, Bernd Hamm, Birte Valentin, Christian Stroszczynski, Christiane Kuhl, Christoph Düber, Christopher Kloth, Daniel Küttling, David Maintz, Einar Kästner, Evelyn Bohner, Fabian Bamberg, Felix Göttinger, Felicitas Meinel, Florian Schwarz, Frank Mosker, Frederik Korkkko, Gabriele Krombach, Gerald Antosch, Gerhard Adam, Gudrun Borte, Hans-Ulrich Kauczor, Herfried Winitzer, Jens Kleesiek, Jens Rieke, Jens-Peter Kühn, Joachim Lotz, Jörg Barkhausen, Kersten Peldschus, Konstantin Nikolaou, Maciej Pech, Malte Sieren, Marc-André Weber, Marcus Both, Marcus Makowski, Matthias Fink, Matias Frölich, Matthias May, Meinrad Beer, Michael Forsting, Michael Ingrisch, Michael Uder, Norbert Hosten, Okta Hamer, Olav Jansen, Peter Infort, Philipp Josef Kuhl, Ralf-Thorsten Hoffmann, Rickmer Braren, Robert Fischen, Roman Klöckner, Sahab Ahmed, Saif Afat, Simon Pilschke, Stefan Schönberg, Thomas Kröckle, Thomas Vogl, Thorsten Bley, Thorsten Persigehl, Timm Denecke, Tobias Penzkofer, Ulf Heichgräber, Ulrike Attenberger, Volker Nikolaou, Walter Heindel, Walter Wohlgenuth

Affiliations: 1 Department of Diagnostic and Interventional Radiology, Goethe University Frankfurt, Frankfurt am Main, Germany; 2 Department of Radiology, University Hospitals Tübingen, Germany; 3 Department of Radiology and Nuclear Medicine, University Hospital Schleswig-Holstein Campus Lübeck, Lübeck, Germany; 4 Interventional and Diagnostic Radiology, University Hospital Aachen, Germany; 5 Department of Radiology, University Hospital Cologne, Germany; 6 Department of Radiology, Charité Medical Faculty Berlin, Germany

Correspondence: Dr. Saif Afat, Diagnostische und Interventionelle Radiologie, Universitätsklinikum Tübingen, Hoppe-Seyler-Strasse 3, 72076 Tübingen, Germany. Tel.: +49/7071/2968423. saif.afat@med.uni-tuebingen.de

Key words: COVID-19, SARS-CoV-2, outpatients, inpatients, surveys and questionnaires

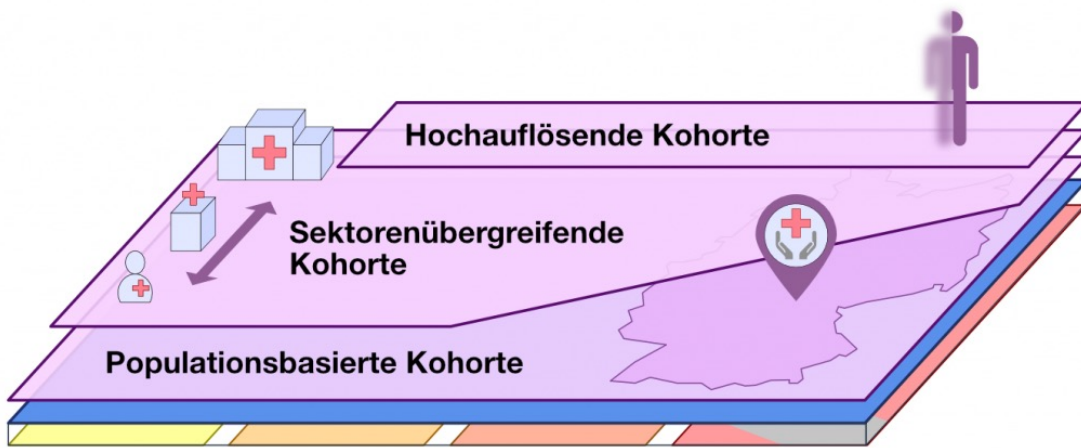
received: 19.05.2021; accepted: 13.07.2021; published online: 2021

ZUSAMMENFASSUNG: Das Ziel war, die Meinungen des stationären und ambulanten medizinisch-radiologischen Personals zu den Maßnahmen zu ermitteln, die im Zusammenhang mit der COVID-19-Pandemie während der ersten und zweiten Welle ergriffen wurden. Zusätzlich sollten die Maßnahmen identifiziert werden, die noch als verbesserungsbedürftig angesehen werden.

RACoon verknüpft Datensätze

Napkon Kooperation

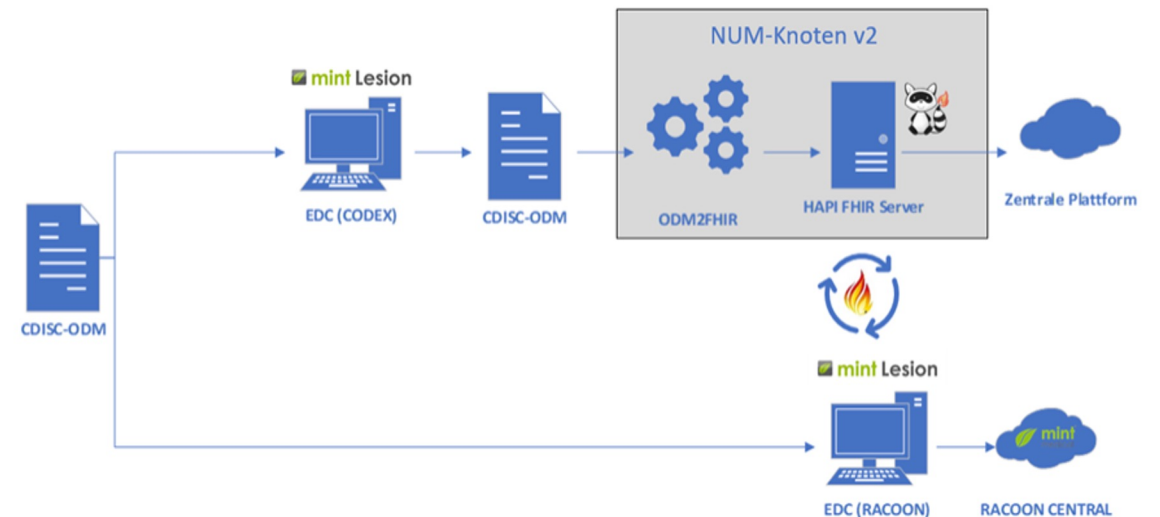
- Prospektiver Studienarm in Kooperation
- Alle Napkon HAP Radiologien beteiligt
- BfS Votum erfolgt / Studienprotokoll gemeinsam abgestimmt



www.napkon.de

Codex Kooperation (MI-I)

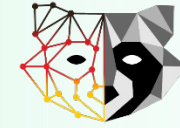
- Umsetzung gemeinsame Datenerhebung erfolgt
- Schnittstelle in CODEX+ mit gemeinsamem Team abgestimmt und für Phase 2 definiert



Phase 2

Geschaffenes Nutzen





BI RACOON – Die Infrastruktur



RACOON Combine – Der Use-Case

2021

2022

2023

2024

Erster Use-case der Infrastruktur



RACOON

Die Radiologie Kooperation im NUM



Primärziel: Identifizierung und Etablierung von bildgebenden Biomarkern (QIBs) bei C19

Bildbasierte Klassifizierung des **allgemeinen Gesundheitszustands**

Bildbasierte Klassifizierung des **spezifischen Gesundheitszustands**

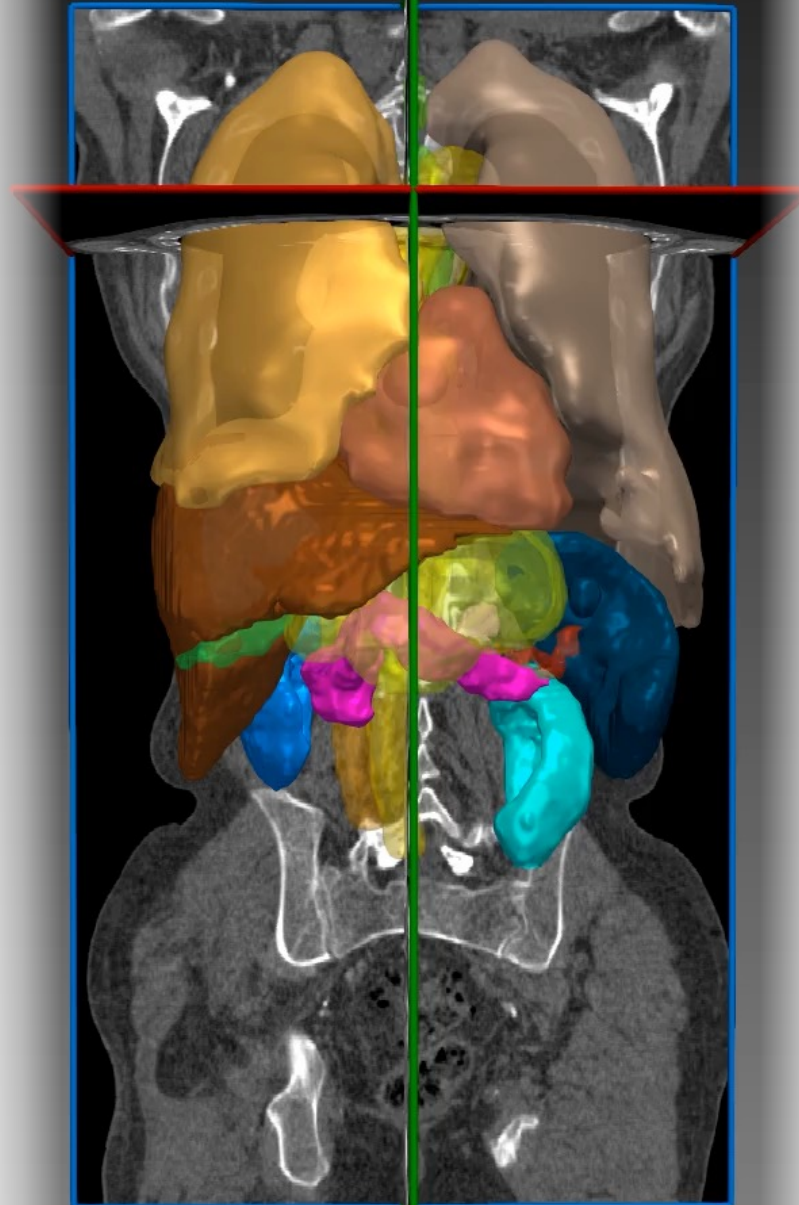
Sekundärziel: Etablierung einer funktionalen Pipeline zur Bereitstellung von Ergebnissen der Bildanalyse für andere NUM-Plattformen

Kardiovaskuläre Gesundheit

Koronar-/Aortenalk
Epicardial Adipose Tissue
Gefäßdiameter
PAH-Indices

Biological Age

Organgesundheit
Sarkopenie
Body Composition
Komorbidom



“Frailty”

Knochenstruktur/-dichte
Hirnkortexmorphie
Kortexdicke

Post-/Long Covid

COVID-Sequelae
Myokardiale
Beteiligung
Neurologische Folgen

Arbeitsplan RACCOON Combine



RACCOON
Die Radiologie Kooperation im NUM

WP1

Komplettieren
Regulatorischer
Fragestellungen

WP2

Expansion
der Kohorte

WP3

QIB Extraktion

WP4

QIB Validierung
& Selektion

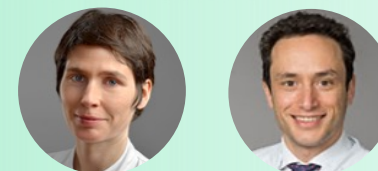
WP5

QIP Workflow
Rollout

THX



Neuro

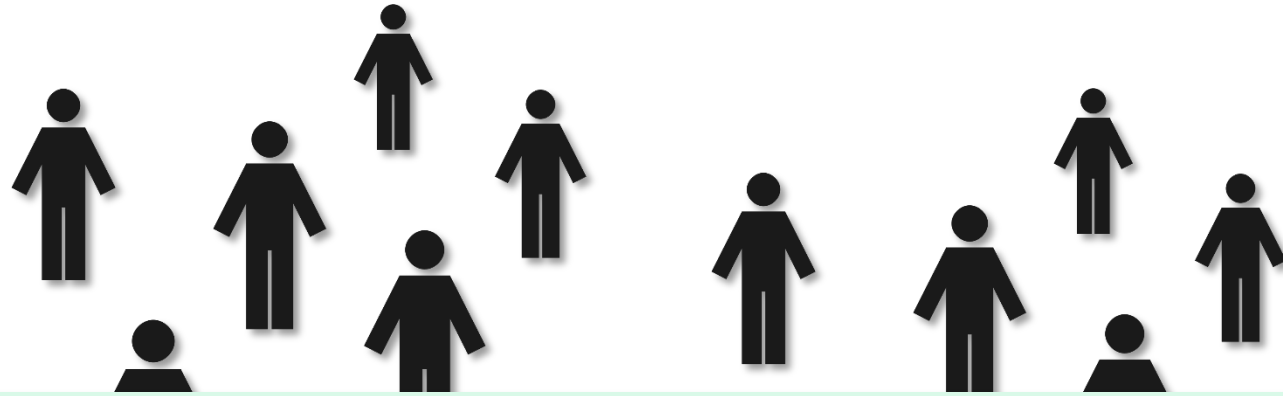


Kinder



Kardio

Die Kohorte



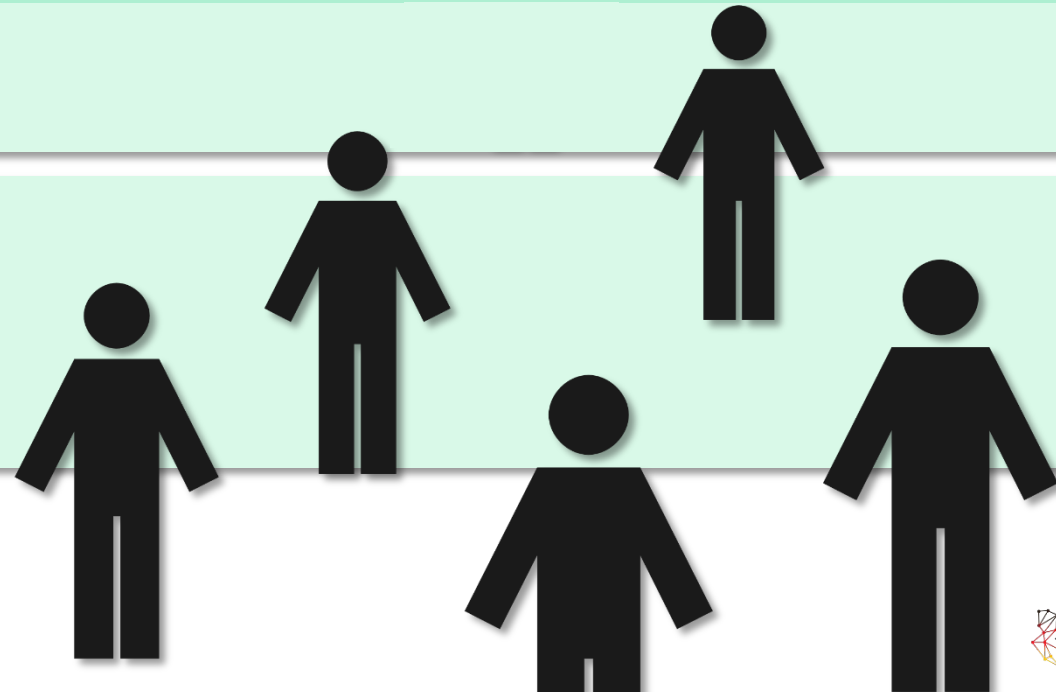
MRT

Myokarditis <i>C19 positiv</i>	Myokarditis <i>C19 geimpft</i>	Myokarditis <i>post C19</i>	Myokarditis <i>ungeimpft</i>	Myokardinfar kt	Dilatative KM
55	129	172	718	402	359

→ 1835 Kardio MRTs

CT

~ 35 Kardio CTs
~ 5500 Thorax CTs



Identifikation & Auswertung von „Quantitative Imaging Biomarkers“

MRT

- Mapping Zeiten
- LGE
- Funktionsparameter
- ...

CT

- Diameter Herz & Gefäße
- Gefäß- und Klappenkalk (Volumen & Lokalisation)
- Fettkompartimente
- Herzmuskelvolumen
- ...



MRI



CT





MEVIS Satori – MRI

Cardio MR Not for clinical use Subject: Anonymous^Patient Shared Session

Study Annotations (2019-11-11)

- Sequences and Image Quality
- Patient/Clinical Data
- End-Diastole/End-Systole Selection
- Cine Segments
- Cine Evaluation
- LGE Segments
- LGE Evaluation
- T2 Segments
- T1 Mapping (Native) Segments
- T1 Mapping CA Segments
- T2 Mapping Segments
- Vena Cava Diameters
- Miscellaneous

GV MR GV MR

Slice: 6 [40] CineSAX GV

Slice: 0 [97] Cine2K MR

MR GV MR

Right Atrial Size 35.6 mm

Left Atrial Size 44.3 mm

MR GV MR

Slice: 0 [99] Cine4K

Slice: 0 [98] Cine3K

Workflow: Reading

Finish Reading



MEVIS Satori – MRI

Cardio MR Not for clinical use Subject: Anonymous* Patient Shared Session

Study Annotations (2019-11-11)

Cine Evaluation

Click to start/stop cine playback.

Start Cine Stop Cine

Normalized Data*
 Yes No

Wall Motion Abnormalities (WMA)*
 none global local

AHA Segments
 Show Legend Show AHA Segments

NORMOKINESIA HYPOKINESIA SEVERE HYPOKINESIA AKINESIA DYSKINESIA

GV MR GV MR

Slice: 6 [40] CineSAX GV

Slice: 0 [97] Cine2K

MR GV MR

Right Atrial Size 35.6 mm

Left Atrial Size 44.3 mm

100 mm 100 mm

Workflow: Reading

Finish Reading

Slice: 0 [99] Cine4K

Slice: 0 [98] Cine3K



MEVIS Satori – MRI

Cardio MR Not for clinical use Subject: Anonymous^Patient Shared Session

Study Annotations (2019-11-11)

Show Legend Show AHA Segments

	Mean	Std Dev.
Basal		
1. anterior	1053.26	106.02
2. anteroseptal	1118.44	116.77
3. inferoseptal	1174.07	135.46
4. inferior	1030.19	99.57
5. inferolateral	1047.47	110.42
6. anterolateral	1059.71	109.51
Mid		
7. anterior	982.99	92.77
8. anteroseptal	1128.2	127.99
9. inferoseptal	1047.15	62.53
10. inferior	1038.24	76.79
11. inferolateral	1038.03	78.95
12. anterolateral	1009.35	62.1
Apical / Apex		
13. anterior	945.83	87.98
14. septal	1012.19	118.95
15. inferior	1018.29	93.87
16. lateral	975.74	99.5
17. Apex	0	0

GV

100 mm

Workflow: Reading

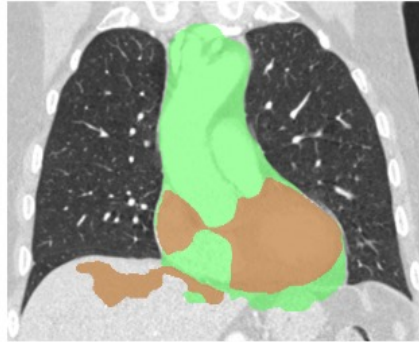
Finish Reading

Slice: 1
1.1.1.1.1 Man Drap

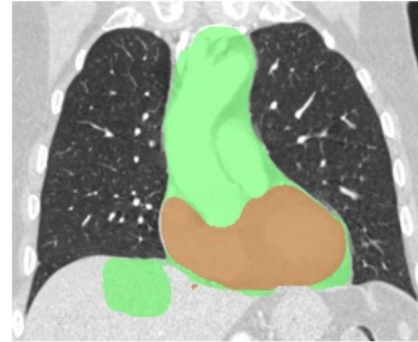
Iteratives KI-Training für Herz & Mediastinalsegmentierungen

Schmidt-Larssen et al., European Congress of Radiology 2023, Vienna

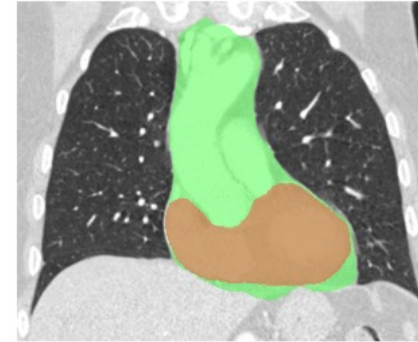
Experiment 1



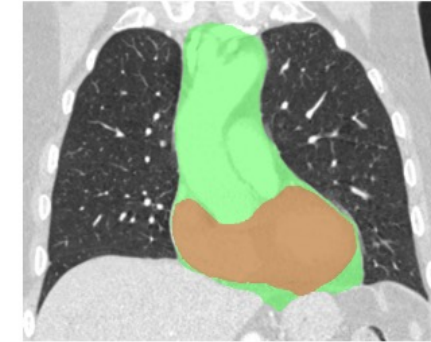
25 data



50 data

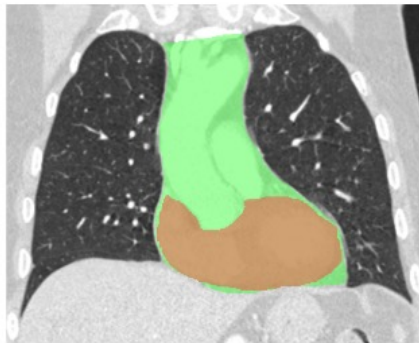


75 data

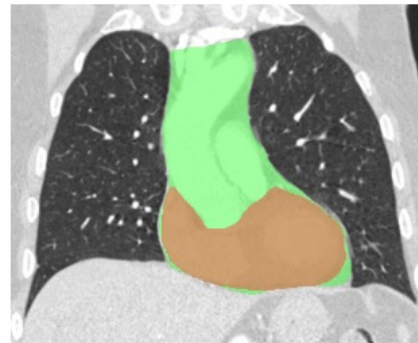


100 data

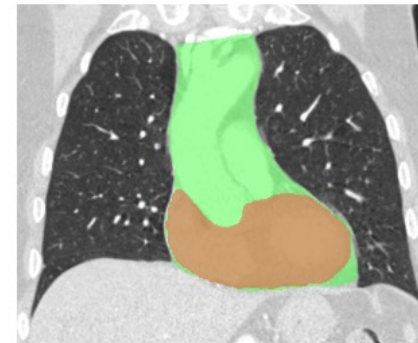
Experiment 2



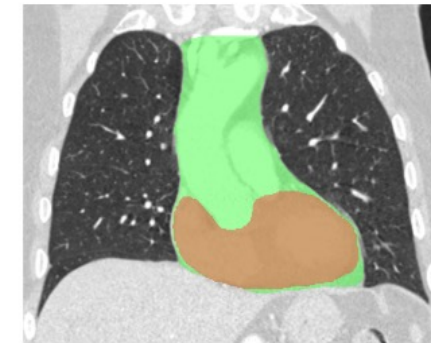
25 data



50 data



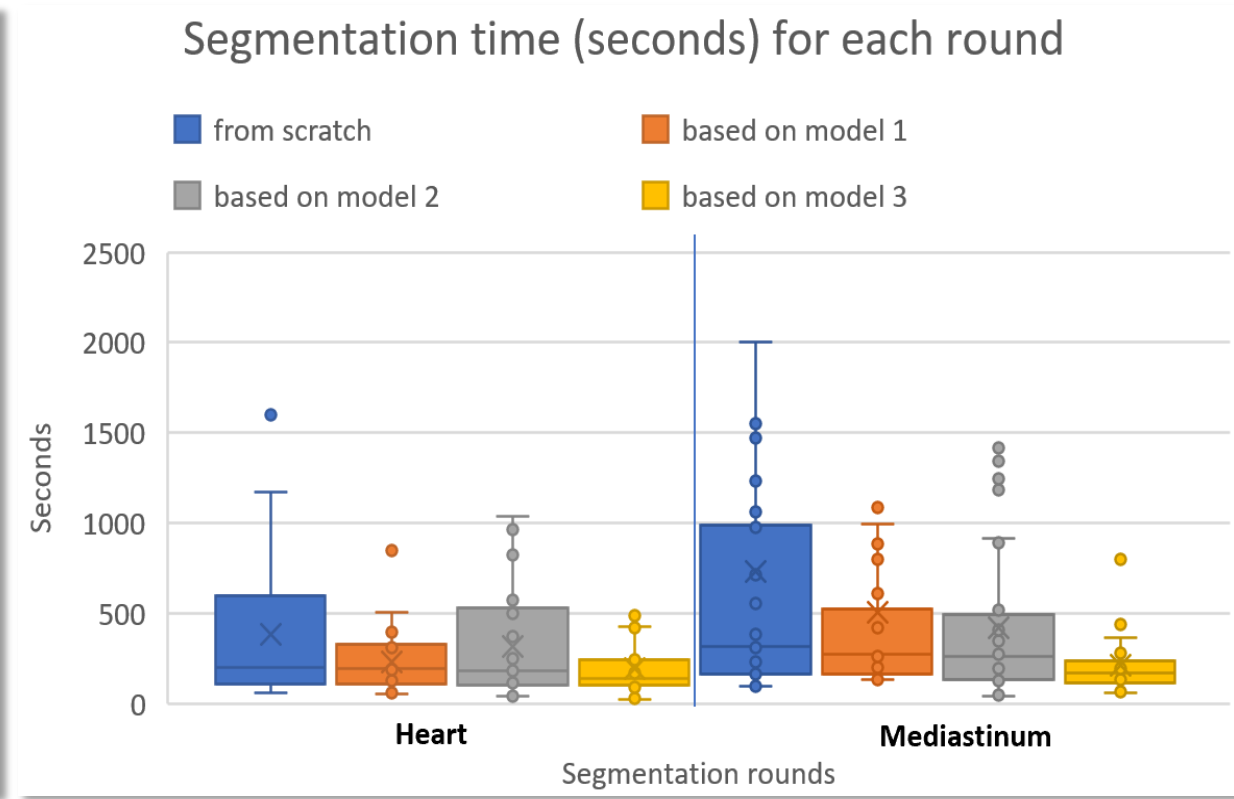
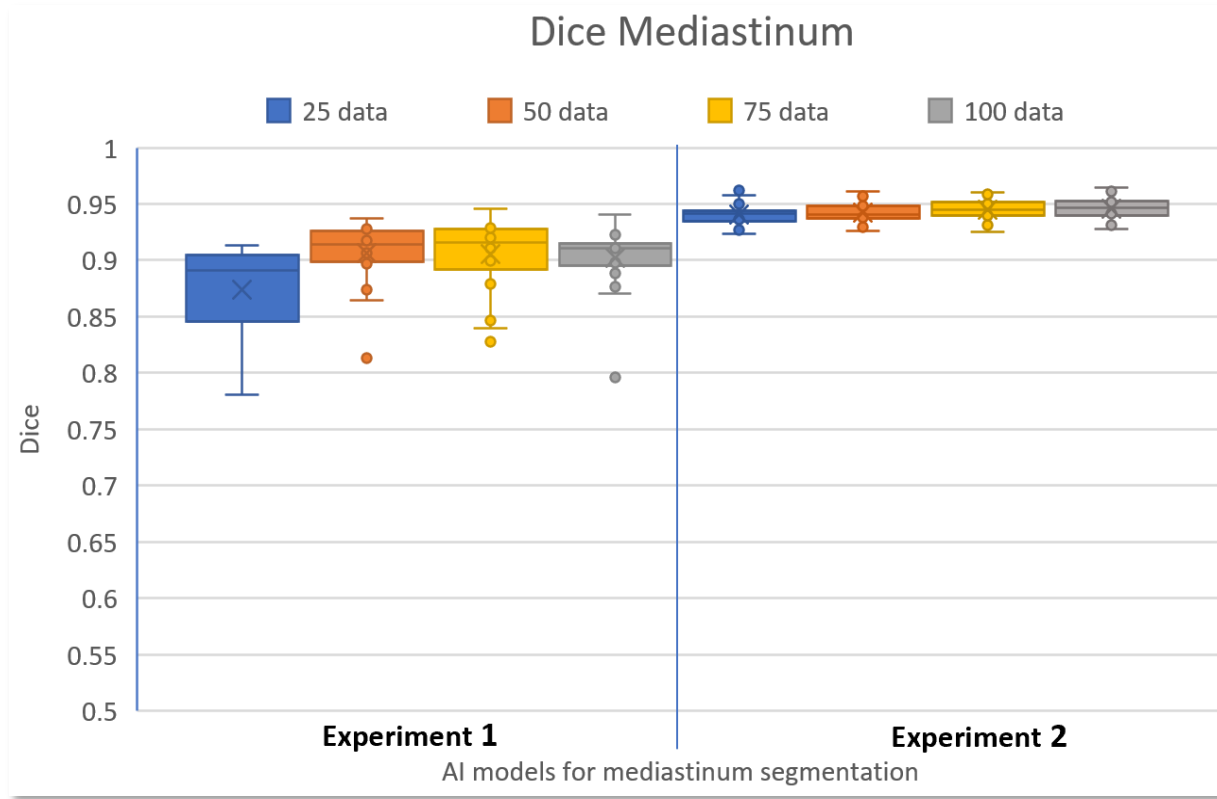
75 data



100 data

Iteratives KI-Training für Herz & Mediastinalsegmentierungen

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Die Basis-Hypothesen

T1 & T2 Mapping

Segmentale Verteilung & Muster vs. Globales Mittel

KI Auswertung von T1 & T2 Mapping

Sind numerische Normwerte wirklich notwendig?

Diagnostische Kriterien zur Differenzierung C19 Myokarditis

Lake Louise 1 & 2 und darüber hinaus

Kardiovaskuläre Indexläsionen bei C19

Beitrag Risikoabschätzung & Frailty Index

Inzidenz der kardialen Entzündung

während C19, nach C19 und nach Impfung



Avisierte Subprojekte

Cardiac long-C19

Status quo und Risikostratifizierung

Strain linker / rechter Ventrikel

Wertigkeit und Umsetzbarkeit im klinischen Alltag

Vergleich Myokarditis Kinder / Erwachsene

COVID, nach Impfung und darüber hinaus

QIBs im CT

Risikostratifizierung vor Kardiochirurgischen Eingriffen

Kalkquantifizierung im CT in der KM-CT

Automatisierung und Auswertung im Rahmen der Fraility



Vielen Dank!

