

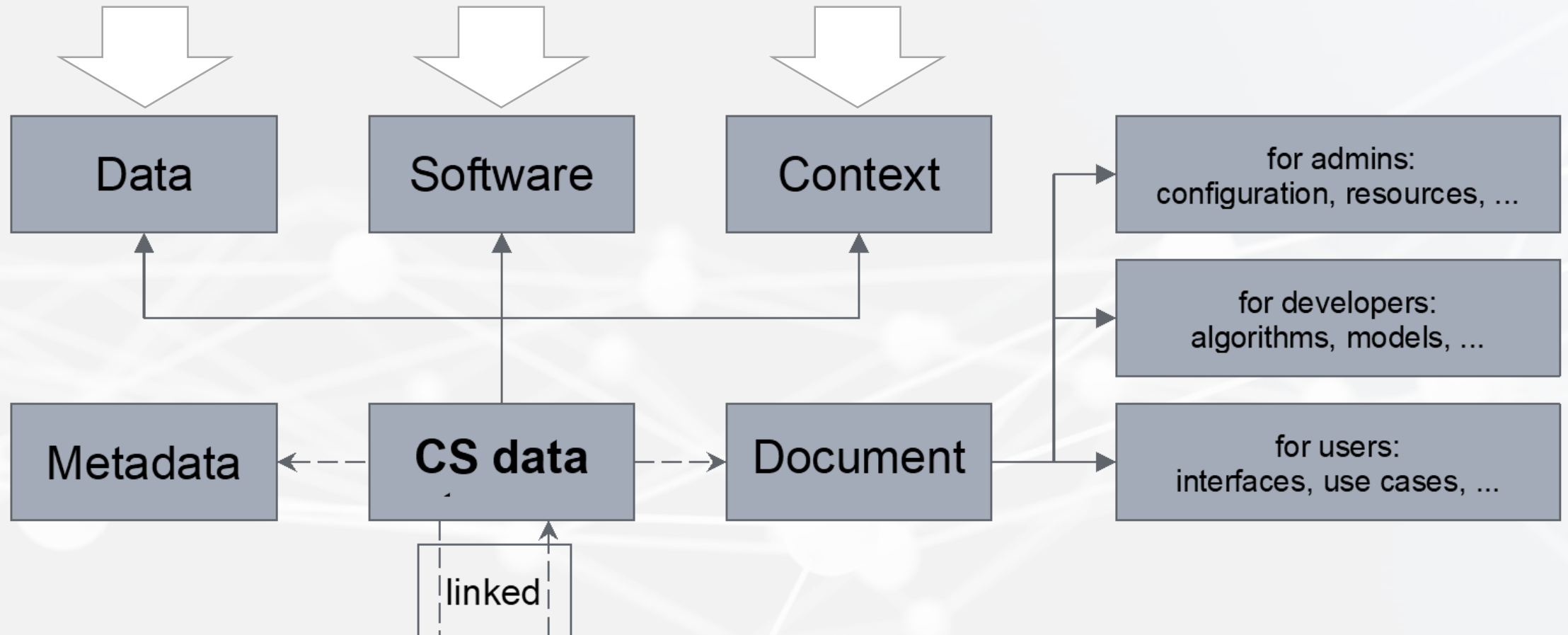


Mathematics and Informatics within the NFDI

Mini-Symposium „Ready for MaRDI“ @DMV-ÖMG 21



„Informatics has own Research Data?!?“



Examples for Computer Science Research Data

```

fun
  fetch :: instr list => state => cell => instr
  where
    fetch p 0 b = (Nop, 0)
    | fetch p (Suc s) Bk =
      (case nth_of p (2 * s) of
        Some i => i
        | None => (Nop, 0))
    | fetch p (Suc s) Oc =
      (case nth_of p ((2 * s) + 1) of
        Some i => i
        | None => (Nop, 0))

lemma fetch_Nil [simp]:
  shows fetch [] s b = (Nop, 0)
  (proof)

```

```

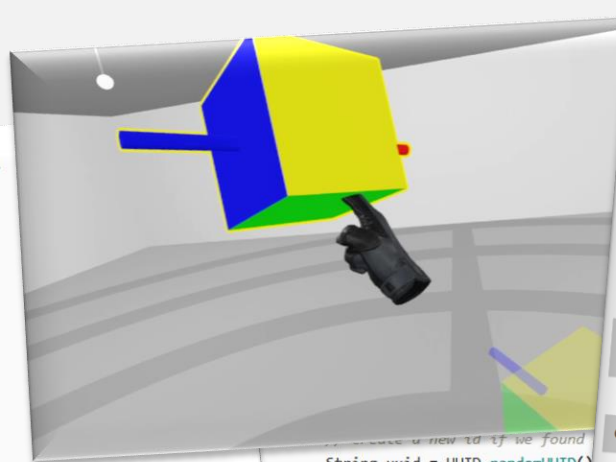
fun
  update :: action => tape => tape
  where
    update WO (l, r) = (l, Bk # (tl r))
    | update WI (l, r) = (l, Oc # (tl r))
    | update L (l, r) = (if l = [] then [], Bk # r) else (tl l, (hd l) # r)
    | update R (l, r) = (if r = [] then (Bk # l, []) else ((hd r) # l, tl r))
    | update Nop (l, r) = (l, r)

```

```

abbreviation
  read r == if (r = []) then Bk else hd r

```



System	OC	FUY	Screenshots	TG							
			P	W	C	H	I	M	S	U	X
checkpoint [0] [1] [2]	GBR	2005	•								
cloudcoder [0]	USA	2013	•	•							
COALA [0]	ESP	2009	•								
code [0] [1]	MKD	2012	•								
code hunt [0] [1] [2]	USA	2014	•								
codeinsghts [0]	PRT	2018	•								
CodeLab [0]	USA	2016	•								
codeOcean [0] [1]	DEU	2016	•								
CodeQ [0]	SVN	2018	•								
CodeRunner [0] [1]	NZL	2016	•								

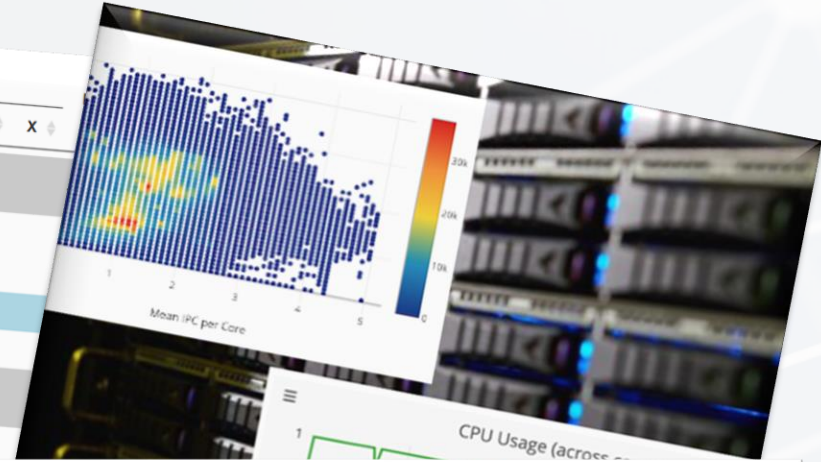
```

String uuid = UUID.randomUUID();
String requestCommand = "INSERT";

if (!Strings.isNullOrEmpty(fullSubmissionPostRequest) &&
    !Strings.isNullOrEmpty(requestCommand)) {
  requestCommand = "REPLACE";
}

String request = String.join(" ", requestCommand.trim(),
  "fullsubmissions ('id', 'version', 'groupId', 'header',
  connection.connect();
// build and execute request
connection.issueInsertOrUpdateStatement(request, uuid, version,
  fullSubmissionPostRequest.getGroupId(),
  fullSubmissionPostRequest.getHeader(),
  fullSubmissionPostRequest.getText(),
  fullSubmissionPostRequest.getProjectName(),
  fullSubmissionPostRequest.getFileRole().toString(),
  fullSubmissionPostRequest.getUserEMail(),
  fullSubmissionPostRequest.getVisibility().toString());

```



Publication search results

found 12,169 matches

2021

- Michele Flammini, Manuel Mauro, Matteo Tonelli: **On fair price discrimination in multi-unit markets.** *Artif. Intell.* 290: 103388 (2021)
- Jiyeon Ham, Soohyun Lim, Kyeng-Hun Lee, Kee-Eung Kim: **Corrigendum to 'Extensions to Hybrid Code Networks for FAIR Dialog Data' Computer Speech & Language volume 53 (2019) Pages 80-91.** *Comput. Speech Lang.* 65: 100961 (2021)
- Zhaoxi Wu, Liqun Fu: **Optimizing job completion time with fairness in large-scale data centers.** *Future Gener. Comput. Syst.* 114: 563-573 (2021)
- Tiantian Li, Wei Ren, Yuexin Xiang, Xianghan Zheng, Tianqing Zhu, Kim-Kwang Raymond Choo, Gautam Srivastava: **FAPS: A fair, autonomous and privacy-preserving scheme for big data exchange based on oblivious transfer, Ether cheque and smart contracts.** *Inf. Sci.* 544: 469-484 (2021)
- Santosh Kumar Bhal, P. Danumjaya, Graeme Fairweather: **The Crank-Nicolson orthogonal spline collocation method for one-dimensional parabolic problems with interfaces.** *J. Comput. Appl. Math.* 383: 113119 (2021)

Repositories for Computer Science Research Data

Archive of Formal Proofs

arXivand

B2SHARE

Bildungsserver

Camunda Modeler

CDSTAR

Cognitive Process Designer

Cross Language Evaluation Forum

Dagstuhl Research Online Publication Server

Dataverse

dblp computer science bibliography

de.NBI

ELIXIR

EMBL-EBI

FAIRdom

GitHub

GitLab repositories

IACR Cryptology ePrint ICSE artifact evaluation track ReMoDD

Invenio

iRODS

koala long-term archiving

Lean mathlib

Learning Online Network

Linked Open Vocabularies

EMBL-EBI

Mizar Mathematical Library

OER repositories

Open Research Knowledge Graph

OSSIRC

Parallel Workloads Archive

PIKA

PROMISE

ReMoDD

meta-data on programming education systems

Repository of solutions to programming exercises

xAPI definitions

Score-P

SSELab

SPEC

SNIA/IOTTA

TIRA

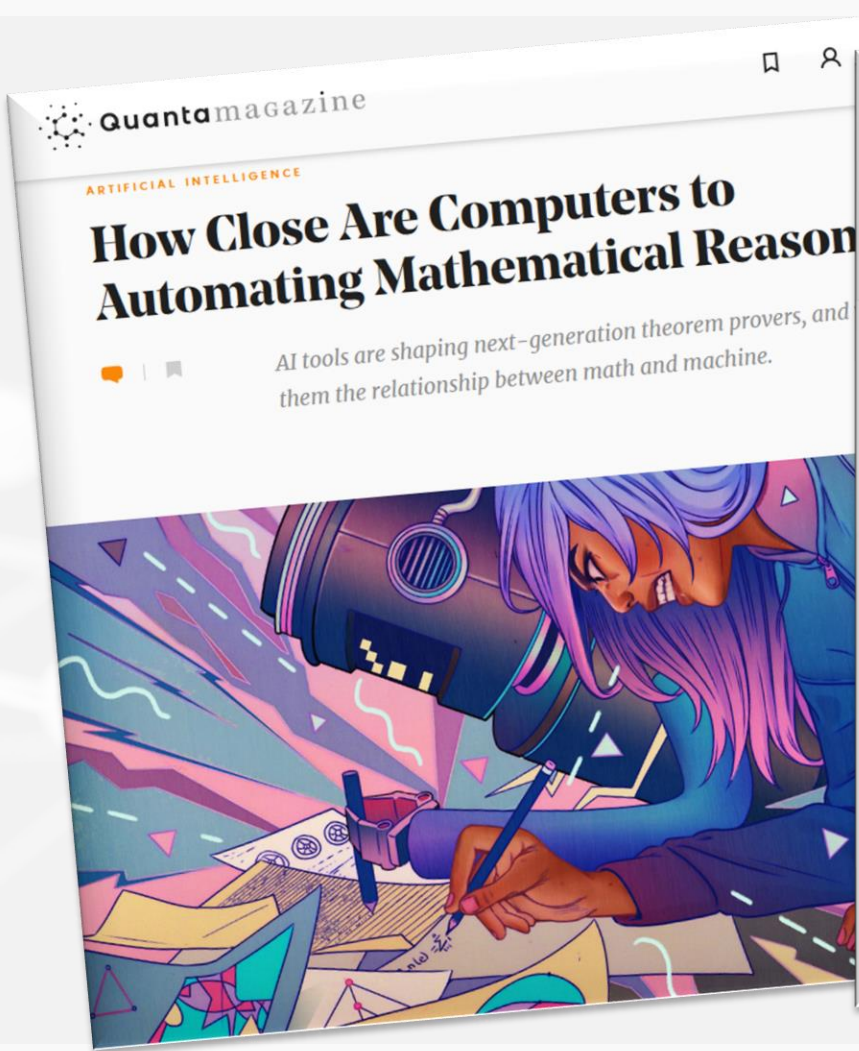
TREC Data Archive

Virus total

xAPI

...

Computer Science and Mathematics



POPL 2022

Sun 16 - Sat 22 January 2022 Philadelphia, Pennsylvania, United States

POPL 2022 (series) / CPP 2022 (series) /

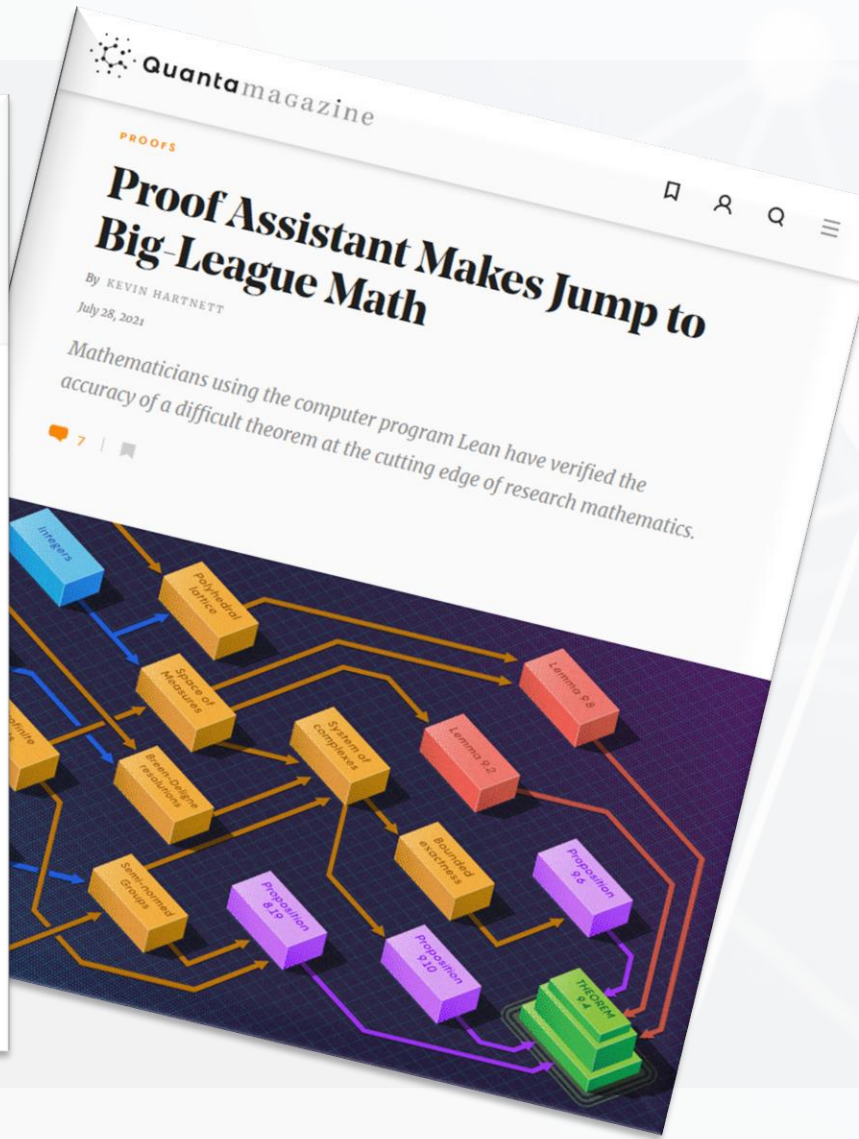
CPP 2022

About Call for Papers Supporting CPP The CPP Series

Certified Programs and Proofs (CPP) is an international conference on practical and theoretical topics in all areas that consider formal verification and certification as an essential paradigm for their work. CPP spans areas of computer science, mathematics, logic, and education. CPP is sponsored by ACM SIGPLAN, in cooperation with ACM SIGLOG.

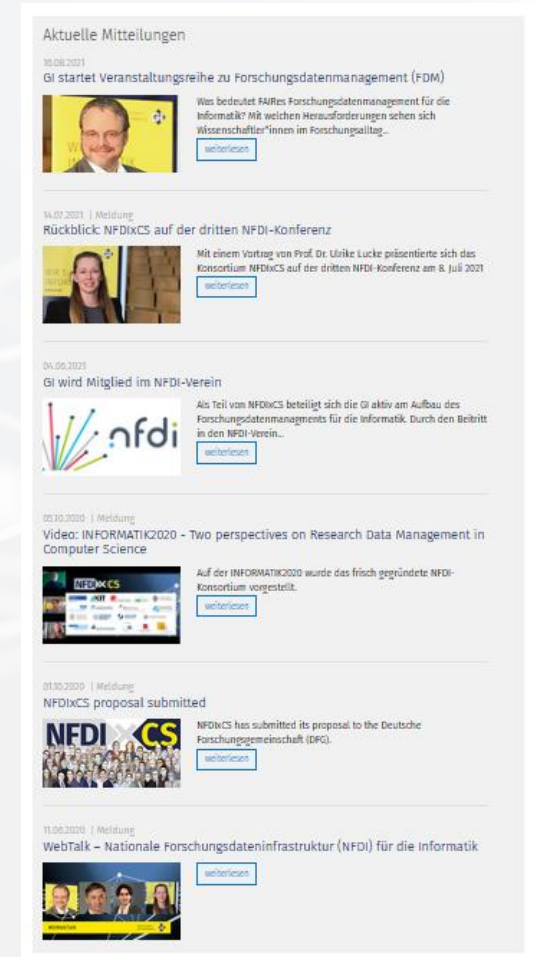
CPP 2022 (<https://popl22.sigplan.org/home/CPP-2022>) will be held on 17-18 January 2022 and will be co-located with POPL 2022 in Philadelphia, Pennsylvania, United States. Additional details will be published as they become available.

Supporters



History of the NFDIxCs Consortium

- Gesellschaft für Informatik – the German Informatics association (since 1969)
- 14 departments and more than 150 special interest groups covering computer science and its applications
- board level task forces: *E-Science* and *Data Science*
- active participation in the NFDI process (LoI in 2019)
- polls and discussions within GI 2019/20
- work on cross-cutting issues (Berlin-Leipzig Declaration)
- web talks to CS aspects of research data management
- joining the NFDI association (2021)

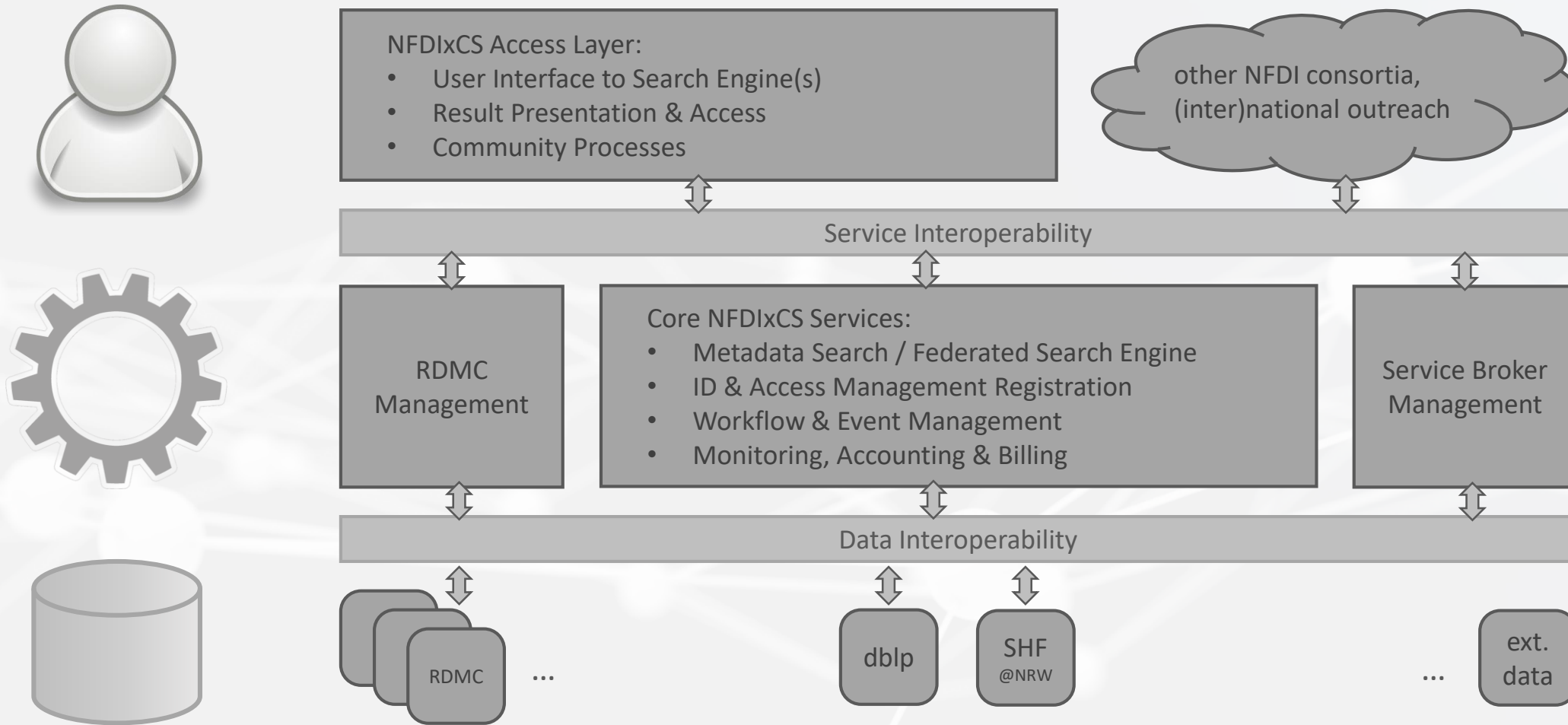


Consortium and Services

- balance of different interest groups:
 - research
(quick response to heterogenous and dynamic requirements)
 - operations
(stable, safe, efficient and maintainable infrastructure)
- disciplinary expertise + powerful tools
from different perspectives
- re-use, adaption and connection of existing services
as far as possible
- high degree of automation for sustainable operation



NFDIxCs Architektur



Cooperation between NFDIxCS and MaRDI

see Thomas Koprucki's talk this morning:



Development of the Community

push from experienced researchers:

- cooperation with conferences and publishers
- mechanisms for quality assurance

supporting young researchers:

- information & awareness campaigns
- trainings & support
- networking
- conferences & publications
- awards

use of existing tools:

- RISE framework
- RMDO web tool
- Data Carpentry lessons



NFDIxCS Mission Statement

- discussion and standardization of CS research data formats, metadata formats, and semantics
- Implementation of the related research data management infrastructure, tools and services:
 - to promote the implementation of the FAIR Data Principles in the CS community for research data as well as software artifacts,
 - to simplify the citability of software and CS data
 - to modernize the publication processes and culture in both CS and its applications
- Support all subdisciplines of the CS community in handling of their research data
- Invoke data sets from other disciplines to further develop genuine CS (research) methods
- Share experience and knowledge of CS (system architectures, processes, standards for interoperability, data-oriented scientific publishing, communication systems, etc.) with others



Gesellschaft für Informatik | www.gi.de

Digitales Kulturerbe

Die Digitalisierung hat unsere Kultur tief durchdrungen. Musik, Videos, Fotos werden inzwischen überwiegend digital hergestellt und verbreitet, Bücher werden digitalisiert, Kommunikation findet über Handys, E-Mails oder Chats statt. Manches wie z. B. Computerspiele hat nicht einmal mehr eine Entsprechung in der analogen Welt. Wenn digitale Informationen nun nahezu von überall her und für jeden zugänglich sind, birgt dies zwar Chancen, stellt uns aber auch vor technische Herausforderungen: Wie lässt sich unsere digitale Kultur dauerhaft bewahren? Wie können virtuelle Objekte angemessen (re)präsentiert und zugänglich gemacht werden?

Wir benötigen Konzepte, um Kulturgüter auch für künftige Generationen begreifbar und erlebbar zu machen. Und ohne nachhaltige Langzeitbewahrung ist unsere digitale Kultur unwiederbringlich verloren. Nur mit Strategien zur Langzeitarchivierung können wir unser digitales Kulturerbe erhalten und ein „Zeitalter ohne Gedächtnis“ vermeiden.

1
DIE
GRAND CHALLENGES
DER INFORMATIK

Mehr Informationen

NFDIxCS.org

Prof. Dr. Michael Goedicke (Universität Duisburg-Essen) – Sprecher
michael.goedicke@paluno.uni-due.de

Prof. Dr. Ulrike Lucke (Universität Potsdam) – stellvertretende Sprecherin
ulrike.lucke@uni-potsdam.de

