Michael Serge Lia Cochez

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(Male)

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Assistant Professor – Vrije Universiteit Amsterdam

https:www.cochez.nl

I am an assitant professor at the Computer Science department of the Vrije Universiteit Amsterdam, working the Knowledge Representation and Reasoning Group. I am the academic lab manager of the Elsevier discovery lab. I work at the intersection of Knowledge Graphs and Machine Learning.

Date and place of birth, nationality, current residence

Born: 22 January 1988, Mortsel, Belgium
Nationality: Belgian
Current Residence: Aachen, Germany

Education and degrees awarded

Ph.D. in Mathematical Information Technology
University of Jyväskylä (JYU)

Jyväskylä, Finland
05/2012–05/2016

- Faculty of Information Technology, Mattilanniemi 2 (P.O.Box 35), 40014 Jyväskylä (Finland)
- Research related to Knowledge Evolution, Ontology Learning and Matching, Scalable Clustering, Evolutionary Computing, and Optimization
- Dissertation Grade: excellent (highest), course work grade: excellent (highest)
- Supervisors: Prof. Vagan Terziyan (JYU) and Prof. Ferrante Neri (Centre for Computational Intelligence, School of Computer Science and Informatics, De Montfort University, United Kingdom)

Master of science in Mathematical Information Technology
University of Jyväskylä (JYU)

Jyväskylä, Finland
09/2009–03/2012

- Faculty of Information Technology, Mattilanniemi 2 (P.O.Box 35), 40014 Jyväskylä (Finland)
- Mobile systems study line. Minor in Physics
- Thesis Grade: very good (one to highest), course work grade: excellent (highest), physics minor: very good (one to highest)
- Advisor: Prof. Vagan Terziyan (JYU)

Bachelor in Information Technology – Great Distinction
University of Antwerp (UA)

Antwerp, Belgium
09/2006–06/2009

- Faculty of Science, Middelheimlaan 1, 2020 Antwerp (Belgium)
- Information technology : Programming, theoretical information technology, databases, basics in computer graphics, mathematics, etc.

General Secondary Education Science–Mathematics
H. Pius-X instituut

Antwerp, Belgium
09/2001–06/2006

- VIIde-Olympiadelaan 25, 2020 Antwerp (Belgium)
- Natural sciences (physics, chemistry, biology, geography), mathematics and an emphasis on languages.

Other education and training, qualifications and skills

Data protection basics Germany
Fraunhofer internal certification 11/2018

- Basics of data protection and privacy (GDPR, BDSG)

International ScaDS Summer School on Big Data Leipzig, Germany
Competence Center For Scalable Data Services and Solutions 07/2016

- The topics of the summer school included big data storage, distributed data processing (HPC, map reduce, streaming, Apache Spark, Apache Flink), graph analytics and management, and big data integration.

CSC Summer School – High Performance Computing Espoo, Finland
Finnish IT Center for Science (CSC) 06/2014–07/2014

- The summer school introduced the participants to the use of high performance computing infrastructure. Topics included were C programming, Message Passing Interface (MPI), OpenMP, Parallel I/O, etc.

Teaching Academic Content trough English (TACE) Jyväskylä, Finland
University of Jyväskylä 03/2012–03/2013

- This program is aimed at the development of the participants' university pedagogical and intercultural communication competences for using English in the multicultural teaching, counseling, and assessment of multilingual and multicultural student groups.

International Summer School – Modern Computational Science Oldenburg, Germany
University of Oldenburg 08/2012

- The summer school contained a variety of lectures on topics related to computational science. Among others there were lectures on random numbers, complexity theory, optimization, interval methods, evolutionary algorithms, etc.

Erasmus Exchange to University of Jyväskylä, Finland (JYU) Jyväskylä, Finland
University of Jyväskylä 09/2008–06/2009

- I went on an exchange to JYU during my bachelor studies, before starting as a master and doctoral student. The following courses were part of the program: Multi core programming, application protocols, mobile programming, real-time systems, agent based systems, requirements management, etc.

Erasmus Intensive Language Course (EILC): Finnish Jyväskylä, Finland
University of Jyväskylä/CIMO 08/2008

- Before my exchange I attended an intensive Finnish language and culture course of one month.

First year secondary school Antwerp, Belgium
Provinciaal Instituut voor Voeding Antwerpen (PIVA) 09/2000–06/2001

- Desguinlei 244, 2018 Antwerp (Belgium)
- Normal secondary school with specialization in food production (bakery, butchery, cooking and waiter techniques)

Linguistic skills

My mother tongue is Dutch. I studied French, English, and German during my secondary school years. I use English and Finnish as everyday communication languages. English is the main language used in my scientific work. I have some experience supervising using the Finnish language as well.

Mother tongue: **Dutch**

Other languages (self-assessment June 2022):

	UNDERSTANDING		SPEAKING		WRITING
	Listening	Reading	Spoken interaction	Spoken production	
English	C2	C2	C2	C2	C2
Finnish	C1	B2	B2	B2	B2
French	B1	B1	A2	A2	A2
German	B1	B2	A2	A2	A2

Levels: A1/A2: Basic user - B1/B2: Independent user - C1/C2: Proficient user
Common European Framework of Reference for Languages[1]

Current positions

Assistant Professor Amsterdam, the Netherlands
Vrije Universiteit Amsterdam - Knowedge Representation and Reasoning *Since 09/2019*
– Research on the intersection of Knowledge Graphs and Machine Learning
– Supervision of PhD., MSc. and BSc. students and projects
– Teaching of courses (Project intelligent systems, Deep Learning, Machine Learning with Graphs)
– Activities to support the working of the department

Previous work experience

Postdoctoral researcher (wissenschaftlicher Mitarbeiter) Aachen, Germany
Fraunhofer Institute – FIT, Knowledge Pipelines *07/2016–09/2019*
– Part of the Knowledge Pipelines group
– Research related to linked data and semantic web, prototype based ontologies, data pipelines, and data mining.
– Project funding acquisition and customer management.

Postdoctoral researcher, on partial leave Jyväskylä, Finland
University of Jyväskylä(JYU) *06/2016–05/2020*
– Master thesis supervision and teaching of several courses.

Scientific Advisor, part-time Jyväskylä, Finland
MyOpt consulting *Since 01/2016*

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[1]see also http://europass.cedefop.europa.eu/en/documents/european-skills-passport/language-passport

– Advisor in artificial intelligence and optimizations related domains.

Research Visit to the Vienna University of Economics and Business Vienna, Austria
host: Prof. Axel Polleres *08/2018*

– During this visit I worked on new directions for question-answer systems on graphs.

Postgraduate student, full-time Jyväskylä, Finland
University of Jyväskylä(JYU) *05/2012–05/2016*

– Research mainly related to my doctoral studies, but also other areas of Multi-Agent Systems
  and Version control in IT education. Grant and project application writing. Teaching of
  several courses and master thesis supervision. (see other sections below for details)

Research Visit to the Insight Centre for Data Analytics Galway, Ireland
host: Prof. Stefan Decker *05/2015–08/2015*

– During this visit I worked on several new ideas related to prototype based ontologies.

Parental leaves
I took about 60 working days of parental leave during the period 11/2013–01/2015

Research assistant in Cloud Software Program Jyväskylä, Finland
University of Jyväskylä(JYU) (part- and full-time) *09/2010–04/2012*

– Implementation of semantic cloud software based on the UBIWARE platform in cooperation
  with Nokia Finland Oy.
– Research on and implementation of data mining algorithms for staff member data. In
  cooperation with Tieto Finland Oy.
– Research on cloud communication channels in cooperation with IPSS Oy (now Steeri Oy).

Junior researcher in UBIWARE Project (part-time) Jyväskylä, Finland
University of Jyväskylä – Agora Center (JYU) *11/2009–12/2010*

– Development and research concerning the UBIWARE semantic agent platform. Focus on
  package policies.

Student worker at IT service department (school holidays) Antwerp, Belgium
Plantijn Hogeschool Antwerp (now Artesis Plantijn Hogeschool Antwerp) *07/2006–07/2008*

– Installing hardware and software, basic helpdesk services, writing manuals, and website design
  and implementation.

Bakery production and sales (when not at school) Antwerp, Belgium
Cochez-Stevens (parents' bakery) *09/2000–08/2008*

Research funding as well as leadership and supervision

Research, Education and Conference travel funding (figures are rounded)

4 year funded PhD position
University of Jyväskylä *05/2012–05-2016*

Funding for several cases in the Cloud Software SHOK project
TEKES (Finland) *01/2010–12/2013*

Funding for several cases in the Need4Speed SHOK project
TEKES (Finland) *01/2014–12/2015*

Grant for ICTERI conference travel €700
ICTERI conference organizers *06/2012*

Summer school in Oldenburg, Germany	€1,300
Erasmus (European Commission)	*08/2012*
Doctoral study grant	€5,000
Nokia Foundation	*01/2013*
Computing resources grant for courses TIES456 and TIES532	$5200
Amazon.com, Inc.	*09/2013*
Computation time for research	10,000 units
Finnish IT Center for Science (CSC)	*03/2014*
Computing resources grant for courses TIES456 and TIES532	$5,600
Amazon.com, Inc.	*09/2014*
Computation time for teaching	10,000 units
Finnish IT Center for Science (CSC)	*10/2014*
Computing resources grant for courses TIES457	$2,000
Amazon.com, Inc.	*11/2014*
Mobility Grant for Research Visit to DERI/Insight Centre, Galway	€4500
JYU research council	*05/2015*
SIGMOD 2015 conference travel and fee	$1,385
Association for Computing Machinery (ACM)	*05/2015*
Computing resources grant for courses TIES456 and TIES532	$3000
Amazon.com, Inc.	*10/2015*
IEEE SSCI 2015 conference travel	$800
Institute of Electrical and Electronics Engineers (IEEE)	*12/2015*
Computation time for research	100,000 units
Finnish IT Center for Science (CSC)	*01/2017*
GPU Titan Xp for research	1 GPU
NVIDIA Corporation	*06/2017*
Grant for research visit to Vienna University of Economics and Business	€1500
WU vienna	*08/2018*
Computational Resources Grant RWTH 20K P100 GPU hours	20K GPU hours
RWTH Aachen	*12/2018*
Grant for research visit to TU Dresden	€650
TU Dresden	*02/2019*
Grant for talk at KIT	€300
Karlruhe Institute of Technology	*03/2019*
H2020 (European Commission), DEMETER	Total 15 M€, own share 250 K€
Digitising and transforming European industry and services	*03/2019*

Thesis supervision

- I supervised or acted as an examiner for more than 40 BSc. and MSc. thesis works.

PhD. student supervision

- I am the co-advisor of the dissertation of Md. Rezaul Karim at the RWTH Aachen University (joint supervison with prof. Stefan Decker, prof. Dietrich Rebholz-Schuhmann, and prof. Oya Deniz Beyan).

- I am the co-promotor of Daniel Daza at the Vrije Universiteit Amsterdam (joint supervison with prof. Paul Groth and prof. Frank van Harmelen)
- I am the co-promotor of Dimitrios Alivanistos at the Vrije Universiteit Amsterdam (joint supervison with prof. Frank van Harmelen)
- I am the co-promotor of Taewoon Kim at the Vrije Universiteit Amsterdam (joint supervison with asst. prof. Vincent François-Lavet, prof. Mark Neerinckx, and prof. Frank van Harmelen)

Merits in teaching and pedagogical competence

Vrije Universiteit Amsterdam since 2019

In the academic year 2022-2023 I will be teaching three courses: *Project intelligent systems*, *Deep Learning*, and *Machine learning with Graphs*. I also teach some lectures in the *Data Mining Techniques*. In 2019-2020 I was also teaching part of the Intelligent systems course.

Project Intelligent Systems This is a practical course in which the students implement a bot which plays a card game against other bots. The students have to create an experimental setup, and use this to evaluate the performance.

Deep Learning A course on deep learning, where I teach on convolutional neural networks and learning with graphs. See also `https://dlvu.github.io/`

Machine Learning with Graphs A course during which student learn about the bleeding edge of research on learning with graphs. As part of the course they will implement and evaluate a technique from a recent paper in the field.

Intelligent systems A course during which we teach several basic AI techniques, based on the AI book by Russel and Norvig. I was teaching parts on probability, fuzzy logic, and Markov chains.

RWTH Aachen 2016-2019

Seminars i5 RWTH Aachen In these courses students work on a specific topic towards a presentation and report at the end of the course. The goal is to prepare the students for writing their master thesis. I was the main contact person and responsible for review of reports, etc. Summer semester 2017, Winter Semester 2017/2018, and Winter Semester 2018-2019 at RWTH Aachen University.

Praktikum i5 RWTH Aachen I organized a, so called, Praktikum on Knowledge Graphs in Spring 2018. This is a course in which bachelor students perform practical tasks.

Courses in which I had a limited role:

Linked Data seminar i5 RWTH Aachen Winter semester 16/17 – description above.

Semantic Web i5 RWTH Aachen 2016 – I taught one of the lectures in this course and was involved in grading of the mid-term test.

University of Jyväskylä 2013-2017

I taught these courses independently at master level at the university of Jyväskyla. Each course was worth five ECTS credits (135 hours of study):

Introduction to service oriented architectures (SOA) and cloud computing 2013, 2014, 2015 – During this course the student got an introduction to technologies used in SOA and cloud computing settings.

Service oriented architectures and cloud computing for developers 2013, 2014, 2015, 2016 – This course was a follow-up course of the TIES456 course. Students worked individually on more advanced tasks related to the topics from the basic course.

Service oriented architectures and cloud computing 2012 – old form of the two courses above (10 ECTS credits).

Big data engineering in 2014 and 2015 as a normal course, in 2017 as a two week intensive course – Multiple topics related to Big Data were be studied. Students will get acquainted to large data sets and streaming. Some storage and processing algorithms were studied and hardware related issues discussed. The gathered knowledge was then applied on real world data sets.

Agent technologies for developers 2014, 2016 – The course is about practical use of distributed AI methods. More concretely of multi-agent technologies, for the development of complex cooperating software systems.

Design of agent-based systems, Part II 2013 – old form of the course above.

Talks and Tutorials:

Deep neural networks for analysing cancer genomics data I had a minor contribution to this tutorial at the SWAT4HCLS 2018 conference. At the same conference we also hosted a tutorial on the same topic in which we looked into problems like Cancer type detection, Predicting cancer subtypes and Predicting survival rate.

Talk - Knowledge Graph Embedding I gave a talk in which I presented an overview of Knowledge Graph Embedding Techniques at the Vienna University of Business and Economics (August 2018).

Talk - Knowledge Graph Embedding As part of the International Semantic Web Research Summer School 2018, I gave a talk in which I presented an short introduction on Knowledge Graph Embedding Techniques.

Talk - Knowledge Graph Embedding and Graph Convolutional Networks I gave a talk in which I presented an short introduction on Knowledge Graph Embedding Techniques as part of my visit to the TU Dresden (February 2019)

Talk - Knowledge Graph Embedding and Graph Convolutional Networks I gave an invited talk in which I presented an short introduction on Knowledge Graph Embedding Techniques at the seminar of the AIFB group at Karsruhe Institute of Technology (February 2019)

Talks after 2019 I have given several talks at Amsterdam Data Science events, companies like Elsevier, and when visiting othere research institutes.

Other merits:

Further skills are acquired in the TACE program (see section *Other education and training, qualifications and skills* above)

Besides the classroom teaching activity, I was the main supervisor of more than 10 master thesis workers. (see section *Research funding as well as leadership and supervision* above).

I have also taken part in curriculum planning and student selection:

- I was a tutor at the Semantic Web Research Summer School in Bertinoro in 2018
- Member of the planning group of the Web Intelligence and Service Engineering (WISE) master program – 2012-2016.
- Member of WISE selection committee – 2013, 2014, 2015, 2016.
- Member of the working groups for curriculum development (2014–2017) in the areas of computation (applied mathematics, data analysis, etc.) and technology (software engineering, mobile systems, sensor networks, games, and gamification) – 2013.

Other academic merits

I am an editor of CEUR-WS `http://ceur-ws.org/`, which is a series of workshop proceedings in computer science.
I am/was a programming committee member for the following scientific forums:

- ISWC 2017, 2018, 2019, 2021 Senior PC, 2022 Senior PC

- ESWC2020 reviewer on Machine Learning Track, 2021 *track chair machine learning*, reviewer for posters and demo track, PhD symposium, 2022

- CIKM 2020, 2021, 2022

- IJCKG 2021 Senior PC

- AAAI 2020 (Student Abstract and Poster track), AAAI 2021 (Student Abstract and Poster track)

- WWW (the Web Conference) (2017 as sub reviewer), 2018 (tracks: Semantics and Knowledge, Web Mining and Content Analysis), 2019 (Semantics and Knowledge, Web Mining and Content Analysis), 2020

- ECAI 2020

- Semantic Web Journal (SWJ) 2017, 2018, 2019, 2020

- Neural Networks journal (Elsevier) 2019

- Web Science 2019

- IJCAI 2019, 2020 (external reviewer)

- Progress in Artificial Intelligence (Springer) - Special issue Applied Cognitive Computing 2018

- Science of Computer Programming Journal (Elsevier), reviewer for Special issue on Systems development by means of semantic technologies

- WIMS 2014, 2015, 2016, 2017, 2018

- Semantic Deep Learning workshop (SemDeep-4) 2018

- ICTERI 2013, 2014, 2015, 2016, 2017

- DEIS workshop 2012

Conference and Workshop organization:

- I was the proceedings editor for ESWC 2020

- I am a co-chair for reproducibility at ISWC 2019

- I was a co-organizer of the Workshop on Deep Learning for Knowledge Graphs at ESWC 2019, ESWC 2020, ISWC 2021, ISWC 2022

- I chaired sessions at ESWC (2021 ML and KGs, 2022 ML and KGs) and ISWC 2021

- I was a co-organizer of the GraphKR 2020 workshop @ ECAI

- I assisted in the organization of a Dagstuhl seminar on Knowledge Graphs: The future of the Semantic Web

- I was a co-organizer of the BigNet workshop at the Web Conference 2018.

- I was a co-organizer of the Workshop on Deep Learning for Knowledge Graphs and Semantic Technologies at ESWC 2018.

- I was an ESWC track co-chair (Machine Learning) 2017.

- I chaired a session on Social Network Analysis and Graph Algorithms for the Web at The Web conference 2018, the Applications session at WIMS 2017, and the Symposium on Differential Evolution at IEEE Symposium Series on Computational Intelligence (SSCI) 2015.

I was invited to a Dagstuhl Seminar on *Knowledge Graphs: The future of the Semantic Web*.
I also reviewed research proposals for DfG (German research foundation) proposal in the area of FAIR data infrastructures and for the Network Institute Academy Assistant 2020-2021 call.
I acted as an *international expert* in the evaluation of the dissertation of dr. Daniel Ayala

Scientific and societal impact of research

- Peer reviewed book chapters, and conference, workshop, and journal papers: 50+

- Technical reports, documentation and articles (non-reviewed): 11

- Posters: 5

- Master thesis and Doctoral dissertation

Ten selected publications[2]:

1. Aidan Hogan, Eva Blomqvist, **Michael Cochez**, Claudia D'amato, Gerard De Melo, Claudio Gutierrez, Sabrina Kirrane, José Emilio Labra Gayo, Roberto Navigli, Sebastian Neumaier, and others. Knowledge graphs. *ACM Comput. Surv.*, 54(4), July 2021. ISSN 0360-0300. doi: 10.1145/3447772. URL https://arxiv.org/abs/2003.02320

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[2]complete list from http://users.jyu.fi/~miselico/research/publications/

2. **Michael Cochez** and Hao Mou. Twister tries: Approximate hierarchical agglomerative clustering for average distance in linear time. In *Proceedings of the 2015 ACM SIGMOD international conference on Management of data*, SIGMOD '15, New York, NY, USA, 2015. ACM. doi: 10.1145/ 2723372.2751521. URL `https://www.cochez.nl/papers/twister_tries.pdf`

3. Dimitrios Alivanistos, Max Berrendorf, **Michael Cochez**, and Mikhail Galkin. Query embedding on hyper-relational knowledge graphs. In *International Conference on Learning Representations (ICLR 2022)*. Openreview, 2022. URL `https://openreview.net/forum?id=4rLw09TgRw9`

4. Erik Arakelyan, Daniel Daza, Pasquale Minervini, and **Michael Cochez**. Complex query answering with neural link predictors. In *International Conference on Learning Representations (ICLR 2021)*. Openreview, 2021. URL `https://openreview.net/forum?id=Mos9F9kDwkz`. Oral presentation, spotlight paper

5. **Michael Cochez**, Petar Ristoski, Simone Paolo Ponzetto, and Heiko Paulheim. Global RDF vector space embeddings. In Claudia d'Amato, Miriam Fernandez, and others, editors, *The Semantic Web – ISWC 2017: 16th International Semantic Web Conference, Vienna, Austria, October 21–25, 2017, Proceedings, Part I*, pages 190–207. Springer International Publishing, Cham, 2017b. ISBN 978-3-319-68288-4. doi: 10.1007/978-3-319-68288-4_12. URL `https://www.cochez.nl/papers/GlobalRDFEmbedding.pdf`

6. Daniel Daza, **Michael Cochez**, and Paul Groth. Inductive entity representations from text via link prediction. In *Proceedings of the Web Conference 2021*, page 798–808. Association for Computing Machinery, New York, NY, USA, 2021. ISBN 9781450383127. URL `https://arxiv.org/abs/2010.03496`

7. Lars C. Gleim, Rafael Schimassek, Dominik Hüser, Maximilian Peters, Christoph Krämer, **Michael Cochez**, and Stefan Decker. Schematree: Maximum-likelihood property recommendation for Wikidata. In Andreas Harth, Sabrina Kirrane, Axel-Cyrille Ngonga Ngomo, Heiko Paulheim, Anisa Rula, Anna Lisa Gentile, Peter Haase, and **Michael Cochez**, editors, *The Semantic Web*, pages 179–195, Cham, 2020. Springer International Publishing. ISBN 978-3-030-49461-2

8. **Michael Cochez**, Stefan Decker, and Eric Prud'hommeaux. Knowledge representation on the web revisited: The case for prototypes. In *The Semantic Web – ISWC 2016: 15th International Semantic Web Conference, Kobe, Japan, October 17–21, 2016, Proceedings, Part I*, pages 151–166. Springer International Publishing, Cham, 2016. ISBN 978-3-319-46523-4. doi: 10.1007/978-3-319-46523-4_10. URL `https://www.cochez.nl/papers/knowledge-representation-prototypes.pdf`

9. **Michael Cochez**, Dominik Hüser, and Stefan Decker. The future of the semantic web: Prototypes on a global distributed filesystem. In *2017 IEEE 37th International Conference on Distributed Computing Systems (ICDCS)*, pages 1997–2006, June 2017a. doi: 10.1109/ICDCS.2017.270

10. Svitlana Vakulenko, Maarten de Rijke, **Michael Cochez**, Vadim Savenkov, and Axel Polleres. Measuring semantic coherence of a conversation. *arXiv preprint arXiv:1806.06411*, 2018. URL `https://www.cochez.nl/papers/semantic_coherence.pdf`. Accepted for presentation and inclusion in the proceedings at ISWC 2018

Positions of trust in society and other societal merits

I was elected to council of the Faculty of Information Technology, University of Jyväskylä
1.1.2014–31.12.2017

I co-organized three coding events for young children (4–9 y.o.) in April, May, and November 2014. We mainly focused on getting children to find their way trough the hour of code: https://studio.code.org/hoc/.

Starting January 2018 I audit (toiminnan tarkastaja) the working of the Aachenin Suomi-koulu (Aachen Finnish school, keeping educational Finnish language events for expats' children).

I am a member of the bi-weekly chair meeting at the i5 – Information Systems & Databases at RWTH Aachen since April 2018.

I was mentor of Maria Angela Pellegrino during her Erasmus placement at Fraunhofer FIT from March 2018 till August 2018

Other merits

I took part in the following research projects:

UBIWARE project 2007-2010 The project's goal was the creation of an innovative middleware supporting complex self-managed industrial systems. The nature of the components managed by the system varies from smart sensors and actuators to web services and humans. A Multi-Agent System was used as a foundation where the beliefs, desires, intentions, and even the communication is performed using S-APL (the Semantic Agent Programming Language).

Cloud software program SHOK 2010-2013 A program directed towards the creation of new business models, lean software principles, and an open infrastructure for a cloud computing environment.

Need4Speed SHOK 2014-2015 An environment for experimenting with real-time business models based on customer insight.

FITScope 2016-2019 The startup project of prof. Stefan Decker at Fraunhofer FIT.

Discover Lab 2020-2025 A joint lab with Elsevier, the Vrije Universiteit Amsterdam and the University of Amsterdam. In this lab we accellerate academic research with artificial intelligence.