Stijn Denissen

FWO JUNIOR POSTDOC · VUB

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Professional Experience

2024-Now **Junior postdoctoral fellow FWO**, AIMS lab, VUB
Postdoctoral researcher funded by a personal junior postdoctoral fellowship. Title: Leveraging recent advances in explainable AI to decode cognitive functioning from T1/FLAIR weighted MR images in MS - An international federated learning approach (12A6U25N). More info: See 'Awards' tab.

2019-2024 **PhD Student (VLAIO Baekeland)**, Industrial doctorate. AIMS lab (VUB) and icometrix NV (Leuven)
Title: Structural brain damage and cognition in MS: an AI approach (HBC.2019.2579). See 'Education' and 'Awards' for more detail.

2018-2019 **Research assistant Prof. Guy Nagels**, AIMS lab, VUB
Initial lab experience working on various projects, including a project on NMSC Melsbroek rehabilitation data, resulting in a paper in the Journal of Central Nervous System Disease, and continuing the Cochrane update.

2018 **Physical therapist**, National Multiple Sclerosis Center Melsbroek
Rehabilitation of patients with multiple sclerosis.

2018 **Research assistant Prof. Geert Verheyden**, Dept. Rehabilitation Sciences, KU Leuven
Updating the 2013 Cochrane review of Prof. Verheyden, resulting in a paper in 2019.

2017 **Physical therapist**, GIRA Campus Pellenberg, UZ Leuven
Geriatric intensive rehabilitation, mainly of patients having suffered a stroke.

Education

Vrije Universiteit Brussel *Brussels*
PhD Medical Sciences *2019 - 2024*
- Title: Structural brain damage and cognition in MS: an AI approach
- Promoters: Prof. Dr. ir. Guy Nagels, Dr. Diana Sima, Prof. Dr. ir. Jeroen Van Schependom
- Personal grant: VLAIO Baekeland (HBC.2019.2579)
- Defense date: 30/01/2024

KU Leuven *Leuven*
MSc Rehabilitation Sciences *2015 - 2018*
- Thesis: Trunk rehabilitation in the different recovery phases post-stroke: a systematic review and meta-analysis
- Promoter: Prof. Dr. Geert Verheyden
- Track: Neurorehabilitation
- Note: I was selected for a research internship on brain stimulation under supervision of Prof. Koen Cuypers.
- Grade: Cum Laude

KU Leuven *Leuven*
BSc Rehabilitation Sciences *2012 - 2015*
- Grade: Cum Fructu

Awards and grants

Over the years, I was successful in several research grants that mainly relied on the two research lines on brain age and federated learning from my PhD. The same research lines also resulted in 2 Chinese Scholarship Council (CSC) for PhD students Tianzheng Hu and Xinguang Wang (cfr. "mentoring").

2024	**FWO Senior project**, Fonds Wetenschappelijk Onderzoek (Role: Project design, writing + writing coordination)	*€ 564.000*
2024	**PhD Thesis of the Year**, VUB UMCOR	*€ 600*
2024	**FWO junior postdoc**, Fonds Wetenschappelijk onderzoek	*± € 300.000*
2023	**Travel grant**, ECTRIMS conference	*€ 400*
2022	**FWO Travel grant**, FWO (Role: Awardee)	*€ 5.808*
	IOF Proof of Concept, (Role: Project design, writing + writing coordination)	*75.000*
2021	**Grant for OpenMR Virtual 2021**, Merck (Role: Awardee)	*€ 1000*
2019	**Baekeland Grant**, Vlaams agentschap innoveren & ondernemen (VLAIO)	*€ 279.475*
2019	**Nominated: Best Young Scientist**, Congress on Neurorehabilitation and Neural Repair	

Teaching

I teach about clinical decision support systems (CDSS) to diverse clinical profiles including doctors, pharmacists, nurses and physiotherapists. My courses have a heavy emphasis on developing a strong background on artificial intelligence.

2025	**Computational Neuroscience**, Jury member: Jury member for Bachelor projects on machine learning on EEG data	*Vietnam National University*
2025	**BICAMS training**, Instructor: Teaching Bach Mai hospital students to take the BICAMS cognitive testing	*Bach Mai hospital, Hanoi, VN*
2020–Now	**Medical Information- and Communication Systems**, Assistant lecturer: Since 2020, I cover the aspect 'Clinical Decision Support Systems' with a heavy emphasis on providing a strong background in AI. Study Program: Master in Healthcare Management Course ID: 4012391ENW	*VUB*
2020–Now	**Information systems**, Assistant lecturer: Since 2020, I cover the aspect 'Clinical Decision Support Systems' with a heavy emphasis on providing a strong background in AI. Study Program: Master in Hospital Hygiene Course ID: B-KUL-E00I9A	*KU Leuven*
2019–2022	**New therapeutic approaches to disorders of the CNS**, Guest lecturer: Yearly guest lecture on the progress of my PhD research	*VUB*

Teaching and Supervision

Besides daily supervision, I coordinate our federated learning research line with a regular meeting. We align students and other researchers in the network to stay informed about each other's work and grant opportunities. I've also been a jury member of 2 master theses in the master in health care management (VUB).

PhD Students (co-promoter)

2025–Ongoing	**Tianzheng Hu ({⊠⊠⊠})**, Exploring the relationship between brain age and neurological disorders	*Medical Sciences*
2024–Ongoing	**Xinguang Wang ({⊠⊠⊠})**, Enhancing performance in deep learning-based brain age prediction models via federated learning	*Medical Sciences*

Master Students

Ongoing	**Mohammad Waleed Adnan**, explaining brain age models with XAI	*Applied Computer Science*
2024	**Louise Van de Looverbosch**, Age prediction based on vaginal microbiome profiles	*Bio-engineering Science*
2024	**Fahimeh Heydarzadeh**, Optimisation of a federated learning architecture for brainage	*Applied Computer Science*
2024	**Alvaro Javier Vargas Guerrero**, Federated learning in neuroimaging: pioneering predictive models for brain age estimation	*Applied Computer Science*
2023	**André Vital Serafim Silva**, Deep Learning for Brain Age Prediction from T1-Weighted Magnetic Resonance Images	*Applied Computer Science*
2022	**Robin Lisa Van den Bosch**, Does deep learning on imaging data enhance accuracy of brain age predictions?	*Applied Computer Science*
2022	**Viktor-Jan De Deken**, Evolutionary random subspace forest for brain age prediction in multiple sclerosis	*Biomedical Science*
2021	**Siebe Clarebout**, Modelling multimodal data to decode cognitive status in MS: A machine learning approach	*Medicine*

Experience abroad

2023	**General Faculty Hospital, Prague (CZ)**, Research Stay 3 months	*Prague (CZ)*
2017	**Dr. Becker Kiliani-Klinik, Bad Windsheim (DE)**, Internship 2 months	*Bad Windsheim (DE)*

Conferences

I presented at 7 international conferences in multiple sclerosis and neurorehabilitation, including two invited talks at the largest MS conference worldwide (ECTRIMS).

2025	**ECTRIMS**, Will AI shift decision making in favor of the PwMS in the next decade?	*Barcelona (ES)*
2025	**BVNV**, Artificiële intelligentie in MS	*Blankenberge (BE)*
2025	**NNR**, Surfing the smartphone wave to support clinical practice	*Maastricht (NL)*
2024	**MOSA**, Panel member	*Maastricht (NL)*
2024	**ECTRIMS**, Invited: What artificial intelligence tools are ready for MS clinical practice	*Copenhagen (DK)*
2022	**IMSCOGS**, Brain age as a surrogate marker for IPS in MS	*Bordeaux (FR)*
2021	**ACTRIMS**, Brain age in MS: An explainable principal component of brain MRI and potential sensitive cognitive biomarker	*Virtual*
2019	**NNR**, Interventions for preventing falls in people after stroke	*Maastricht (NL)*
2019	**RIMS**, The impact of cognitive dysfunction on locomotor rehabilitation potential in MS	*Ljubljana (SL)*
2019	**RIMS**, The effects of multidisciplinary rehabilitation in MS	*Ljubljana (SL)*

Extracurricular

Research community engagement

2025–now	**iAIMS**, Founder. iAIMS community. https://iaims.org	*International*
2025–now	**AIMS lab**, Supervisor. BIDS data format taskforce	*AIMS lab, VUB*
2021–2021	**OpenMR**, Organiser of the 2021 edition.. OpenMR conference. https://openmrbenelux.github.io/	*Virtual*

Student engagement

2019–2021	**NSE PhD Network**, Board member.	*VUB*
2015–2017	**Artifex**, Co-founder. Artifex	*Leuven*
2014–2015	**Apolloon**, Board member. Apolloon	*KU Leuven*

Science communication and media

Over the years, I experimented with different forms of science communication, tailored for different audiences including physiotherapists, patients with MS, and even children. My idea to turn a paper into a song was particularly well received; SciMingo asked me to perform live at the final of the Flemish Thesis Prize at the Brussels city hall. Finally, I poured my PhD into a 3 minute song, performing it live when I received the 'PhD of The Year' award.

2025	**3 minute thesis competition Vietnam**, Jury member for a national competition on science communication among engineering students. The challenge: to explain their research in 3 minutes with a single slide.	*Event*
2025	**Vergeet Dementie**, I contributed to the vulgarising book 'Vergeet Dementie' by authors Ms. Ceuleers and Prof. Engelborghs. I was interviewed by Ms. Ceuleers about the concept of 'brain age', and provided a layman summary for their book.	*Event*
2025	**De Specialist**, Interview on smartphone symptom screening together with Dr. Delphine Van Laethem (also in other media channels)	*Interview*
2024	**LACTRIMS interview**, Interview by Dr. Lorna Galleguillos on my talk entitled 'What artificial intelligence tools are ready for MS clinical practice' during the educational session on 'Clinical implications of digital monitoring and artificial intelligence in MS and related disorders' at ECTRIMS 2024 in Copenhagen	*Interview*
2024	**Award ceremony 'PhD of The Year'**, Live performance of my PhD in a 3-minute song, in synchrony with my 'a paper in a song' initiative.	*Live Performance*
2024	**Het Nieuwsblad**, Interview on brain age	*Interview*
2023	**VUB PhD day**, Live performance 'A paper in a song'	*Live Performance*
2023	**Book presentation 'A question of truth'**, Interview in the Brussels city hall together with my promoter Prof. Guy Nagels. We discussed our chapter contribution on medical diagnosis and AI.	*Interview*
2022	**Award ceremony Flemish Thesis Prize (SciMingo)**, Live performance 'A paper in a song'	*Live Performance*
2022	**KNGF Fysiopraxis**, Vulgarising article about our Cochrane review on interventions to prevent falls post-stroke. Title: 'Oefentherapie voorkomt vallen na een CVA'.	*Article*
2021	**Children's university VUB**, Title of the workshop I presented to primary school childeren: 'How old is my brain?'. In this workshop, I converted my PhD work in a comprehensible framework for young children. Together, we explored how AI can measure brain structures, and how we can use it to predict the age of my brain.	*Event*
2021	**YouTube channel**,	*Website*
2021	**Artsenkrant**, Interview about ACTRIMS 2021 presentation on brain age.	*Interview*
2021	**Wetenschap Brussel + EOS (Cognition)**, Blog about cognition, together with Dr. Delphine Van Laethem. Title: 'Hersenspinsels: een editie over cognitie'	*Article*
2021	**Haelio Neurology**, Interview about ACTRIMS 2021 presentation on brain age	*Interview*
2020	**Wetenschap Brussel + EOS (AI)**, Blog about artificial intelligence.Title: 'Hersenspinsels: artificiële intelligentie'	*Article*

Note: Please click text in bold for more info if available.

Languages

🇳🇱 Dutch	**Native**	🇬🇧 English	**Fluent**
🇫🇷 French	**Proficient**	🇮🇹 Italian	**Proficient**
🇩🇪 German	**Proficient**	🇨🇿 Czech	**Basic**
🇨🇳 Chinese	**Beginner, actively learning**		

Publications

Denissen S, Laton J, Grothe M, Vaneckova M, Uher T, Kudrna M, Horáková D, Baijot J, Penner I-K, Kirsch M, Motýl J, De Vos M, Chén OY, Van Schependom J and Nagels G 2026. Real-world federated learning for brain imaging scientists. Frontiers in Digital Health 8:1691088. **IF: 3.8, Q1 2024**

Xinguang Wang, Nguyen Linh Trung, Oliver Y. Chen, Jeroen Van Schependom, Stijn Denissen and Guy Nagels 2026. PDD-FANs: Personalized Decentralized Federated Adversarial Networks with Defense Mechanism in Non-IID Setting. IEEE TrustCom 2025 (Conference) .

Sosa A, O'Neill KA, Billiet T, Chen J, Couvreur L, **Denissen S**, Lustberg M, Pehel S, Ribbens A and Krupp L 2025. Incorporating measures of cognitive processing speed and brain volume in clinical management of pediatric onset MS. Pediatric Neurology . **IF: 2.1, Q2 2024**

Trinh Ngoc Huynh, Nguyen Duc Kien, Nguyen Hai Anh, Dinh Tran Hiep, Manuela Vaneckova, Tomas Uher, Jeroen Van Schependom, Stijn Denissen, Tran Quoc Long, Nguyen Linh Trung and Guy Nagels 2025. Latent Representation Learning from 3D Brain MRI for Interpretable Prediction in Multiple Sclerosis. arXiv preprint arXiv:2510.00051.

Denissen S*, Van Laethem D*, Baijot J, Costers L, Descamps A, Van Remoortel A, Van Merhaegen-Wieleman A, D'hooghe M, D'Haeseleer M, Smeets D, Sima DM, Van Schependom J and Nagels G 2025. A New Smartphone-Based Cognitive Screening Battery for Multiple Sclerosis (icognition): Validation Study. Journal of Medical Internet Research 27, e53503. **IF: 6.0, Q1 2024**

De Keersmaecker E, Guida S, **Denissen S**, Dewolf L, Nagels G, Jansen B, Beckwée D and Swinnen E 2025. Virtual reality for multiple sclerosis rehabilitation. Cochrane Database of Systematic Reviews (1). **IF: 9.4, Q1 2024**

Wittens MMJ*, **Denissen S***, Sima DM, ..., Engelborghs S 2024. Brain age as a biomarker for pathological versus healthy ageing–a REMEMBER study. Alzheimer's research & therapy 16.1 (2024): 128. **IF: 7.6, Q1 2024**

Van Laethem D*, **Denissen S***, Costers L, Descamps A, Baijot J, Van Remoortel A, Van Merhaegen-Wieleman A, D'hooghe M, D'Haeseleer M, Smeets D, Sima DM, Van Schependom J and Nagels G 2024. The Finger Dexterity Test: Validation study of a smartphone-based manual dexterity assessment. Multiple Sclerosis Journal 30(1), 121-130. **IF: 5.0, Q1 2024**

Denissen S, Van Schependom J, Nagels G 2023. Medical diagnosis and a new kid in town: AI. Book chapter in VUB book 'A question of truth' .

Thijs L, Voets E, **Denissen S**, Mehrholz J, Elsner B, Lemmens R and Verheyden G 2023. Trunk training for improving activities in people with stroke. Stroke 54(9), e427-e428. **IF: 7.9, Q1 2023**

Thijs L, Voets E, **Denissen S**, Mehrholz J, Elsner B, Lemmens R and Verheyden G 2023. Trunk training for improving activities in people with stroke. Cochrane Database of Systematic Reviews (3). **IF: 8.8, Q1 2023**

Baijot J, Van Laethem D, **Denissen S**, Costers L, Cambron M, D'Haeseleer M, D'hooghe MB, Vanbinst A, De Mey J, Nagels G and Van Schependom J 2022. Radial diffusivity reflects general decline rather than specific cognitive deterioration in multiple sclerosis. Scientific Reports 12(1), 21771. **IF: 4.6, Q2 2022**

Denissen S and Nagels G 2022. Artificial intelligence will change MS care within the next 10 years: Yes. Multiple Sclerosis Journal 28(14): e53503. **IF: 5.8, Q1 2022**

Denissen S, Engemann DA, De Cock A, Costers L, Baijot J, Laton J, Penner I-K, Grothe M, Kirsch M, D'hooghe MB, D'Haeseleer M, Dive D, De Mey J, Van Schependom J, Sima DM and Nagels G 2022. Brain age as a surrogate marker for cognitive performance in multiple sclerosis. European journal of neurology 29(10): 3039-3049. **IF: 5.1, Q1 2022**

Denissen S, Chen OY, De Mey J, De Vos M, Van Schependom J, Sima DM and Nagels, G 2021. Towards multimodal machine learning prediction of individual cognitive evolution in multiple sclerosis. Journal of personalized medicine 11(12), 1349. **IF: 3.508, Q2 2021**

Baijot J*, **Denissen S***, Costers L, Gielen J, Cambron M, D'Haeseleer M, D'hooghe MB, Vanbinst A, De Mey J, Nagels G and Van Schependom J 2021. Signal quality as Achilles' heel of graph theory in functional magnetic resonance imaging in multiple sclerosis. Scientific Reports 11(1), 7376. **IF: 4.997, Q2 2021**

Denissen S, Staring W, Kunkel D, Pickering RM, Lennon S, Geurts ACH, Weerdesteyn V and Verheyden GS 2020. Interventions for preventing falls in people after stroke. Stroke 51 (3), e47-e48. **IF: 7.914, Q1 2020**

Denissen S, De Cock A, Meurrens T, Vleugels L, Van Remoortel A, Gebara B, D'Haeseleer M, D'Hooghe MB, Van Schependom J, and Nagels G 2019. The Impact of Cognitive Dysfunction on Locomotor Rehabilitation Potential in Multiple Sclerosis. Journal of central nervous system disease 11, 1179573519884041.

Denissen S, Staring W, Kunkel D, Pickering RM, Lennon S, Geurts ACH, Weerdesteyn V and Verheyden GS 2019. Interventions for preventing falls in people after stroke. Cochrane database of systematic reviews (10). **IF: 7.89, Q1 2019**

* indicates joint first authorship.