



SACAIR2022

Southern African Conference
for Artificial Intelligence Research
AI for Social Justice

STIAS, Stellenbosch (Hybrid)

5 - 9 December 2022

Monday, 5 December 2022 | Unconference Day

08:00	-	08:30	Registration Tea & Coffee
08:30	-	09:15	Industry presentations: Spatial Edge (Applications of AI)
09:15	-	10:00	Industry presentations: Praelaxis (Ethics in AI)
10:00	-	10:45	Industry panel discussion
10:45	-	11:00	Tea & Coffee Refreshments
11:00	-	12:40	Unconference Student Symposium (Presentation time-slots to be confirmed)
12:40	-	13:00	Shared Task Presentation and Announcement of the Competition Winner
13:00	-	14:00	Lunch
14:00	-	14:30	BMW AWS DeepRacer Event Introduction
14:30	-	16:00	BMW AWS DeepRacer Competition
16:00	-		BMW AWS DeepRacer SACAIR2022 Cocktail
16:00	-	18:00	BMW AWS DeepRacer Competition



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Tuesday, 6 December 2022 | Tutorials

Auditorium I | Tutorials

07:30 - 08:30	Registration Tea & Coffee
08:30 - 10:30	What is AI Ethics and why should you care? Emma Ruttkamp-Bloem Professor Head of Department Philosophy University of Pretoria
10:30 - 11:00	Tea & Coffee Refreshments
11:00 - 13:00	NVIDIA Fundamentals of Deep Learning Dustin van der Haar Associate Professor University of Johannesburg
13:00 - 14:00	Lunch
14:00 - 16:00	NVIDIA Fundamentals of Deep Learning (Continued) Dustin van der Haar Associate Professor University of Johannesburg
16:00 - 16:30	Tea & Coffee Refreshments

Auditorium II | Tutorials

07:30 - 08:30	Registration Tea & Coffee
08:30 - 10:30	No Parallel Tutorial
10:30 - 11:00	Tea & Coffee Refreshments
11:00 - 13:00	Generative adversarial networks (GANs): design, use-cases, and threats Emile Engelbrecht Ph.D. Candidate University of Stellenbosch
13:00 - 14:00	Lunch
14:00 - 15:30	Amazon SageMaker Clarify Kgomotso Welcome Solutions Architect Amazon Web Services
15:30 - 16:30	A pragmatic display of Human-AI Symbiosis A theoretical approach to AI adoption Danie Smit – BMW ZA Hub Alex Botskor – BMW Group Karel Kruger – Stellenbosch University
16:30 - 16:45	Tea & Coffee Refreshments
16:30 - 17:15	A pragmatic display of Human-AI Symbiosis (Continued) A pragmatic approach to AI adoption: Digital Twin, Circular Economy and AI Danie Smit – BMW ZA Hub Alex Botskor – BMW Group Karel Kruger – Stellenbosch University



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Tuesday, 6 December 2022 | NITheCS Workshop

Manor House Library | NITheCS Workshop

07:30 - 08:30 Registration | Tea & Coffee

08:30 - 09:00 **Welcome & Introduction**
Stefan Lotz, SANSA

09:00 - 09:40 **Interpretability in time series data**
Marelle Davel, NWU

09:40 - 10:10 **Case study: solar wind magnetosphere coupling**
Chara Grant, NWU

10:10 - 10:40 **Adaptive knowledge discovery in a complex, dynamical ecosystem for large protected area conservation**
Sandra MacFadyen, SU

10:40 - 11:00 Tea & Coffee | Refreshments

11:00 - 11:30 **Leveraging machine learning to identify and predict temporal dynamics in a synthetic microbial community**
Cleo Conacher, SU

11:30 - 12:00 **AI for Covid 19 hospitalisation: using statistical and ML methods for predicting health outcomes between health systems entities in South Africa**
Taurai Chikotie, SU

12:00 - 12:30 **Machine learning as a tool to detect prey capture events from free-ranging Chinstrap Penguins**
Stefan Schoombie, UCT

12:30 - 13:30 Lunch

13:30 - 14:00 **Know-it toolkit**
Tian Theunissen, NWU

14:00 - 14:30 **Progress to date**
Stefan Lotz

14:30 - 15:00 **Next steps**
Marelle Davel

15:00 - 15:30 **Closure**
Francesco Petruccione, SU & NITheCS

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Wednesday, 7 December 2022 | Main Conference | Day One

07:30 - 08:30	Registration Tea & Coffee		
08:30 - 08:45	Welcome by Prof Bruce Watson, University of Stellenbosch, Co-Chairperson of the 2022 SACAIR Local Organising Committee		
08:45 - 09:45	Sabelo Mhlambi, Berkman Klein Center, Harvard University		
	Session Chair: Emma Ruttkamp-Bloem, University of Pretoria		
	Time Online		
09:45 - 10:05	20 Does Counterfactual Reasoning Hold the Key to Artificial General Intelligence? <i>Ethan Vorster</i>		Ethan Vorster
10:05 - 10:25	20 Answerability, Accountability, and the Demands of Responsibility <i>Fabio Tollon</i>		Fabio Tollon
10:25 - 10:40	15 AI Ethics as Reasoning <i>Emma Ruttkamp-Bloem</i>		Emma Ruttkamp-Bloem
10:40 - 10:55	15 Re-assessing Google as Epistemic Tool in the Age of Personalisation <i>Tanya de Villiers-Botha</i>		Tanya de Villiers-Botha
10:55 - 11:00	Danie Smit, message from our sponsor ZA Hub, BMW Digital & Global Solutions		
11:00 - 11:05	Session Wrap Up		
11:05 - 11:30	Tea & Coffee Refreshments		
	Session Chair: Sunet Eybers, University of South Africa (UNISA)		
	Time Online		Wednesday 7 December
11:30 - 11:50	20 AI for Social Good: Sentiment Analysis to Detect Social Challenges in South Africa <i>Tim Schlippe</i>		Koena Ronny Mabokela and Tim Schlippe
11:50 - 12:10	20 A Model for Biometric Selection in Public Services Sector <i>Elisa Maeko</i>		Elisa Maeko and Dustin van der Haar
12:10 - 12:30	20 Technology days: An AI democratisation journey begins with a single step <i>Danie Smit</i>		Danie Smit, Sunet Eybers, Alta de Waal and Nhlanhla Sibanyoni
12:30 - 12:50	20 The Preparation of South African Companies for the Impact of Artificial Intelligence <i>Aurona Gerber</i>		Aurona Gerber and Tiaan Taljaard
12:50 - 13:05	15 ✓ Global To Local: South African Perspectives on AI Ethics Risks <i>Emile Ormond</i>		Emile Ormond
13:05 - 13:10	Session Wrap Up		
13:10 - 13:55	Lunch		

Session Chair: Aurna Gerber, University of Pretoria

Time | Online

Wednesday | 7 December

13:55 - 14:10	15	✓	AI Competencies for Competitive Advantage: A Systematic Literature Review <i>Jurgens De Bruin</i>	Jurgens De Bruin and Aurna Gerber
14:10 - 14:25	15		A process for embedding ethics into the Information Systems curriculum in South Africa <i>Johan Breytenbach</i>	Johan Breytenbach, Yusuf Adams and Carolien van den Berg
14:25 - 14:40	15		Model-based Defeasible Reasoning <i>Jaron Cohen</i>	Jaron Cohen, Carl Combrinck and Thomas Meyer
14:40 - 15:00	20		Relevance in the computation of non-monotonic inferences <i>Jesse Heyninck</i>	Jesse Heyninck and Thomas Meyer

15:00 - 15:45 **Gabriela Ramos, Assistant Director-General for the Social and Human Sciences, UNESCO**

15:45 - 16:05 Tea & Coffee | Refreshments

Session Chair: Louise Leenen, University of the Western Cape

Time | Online

Wednesday | 7 December

Cancelled	20	✓	Anomaly Detection in Continuous Stirred Reactor (CSTR) Using Deep Learning <i>Shikar Rajcomar</i>	
16:05 - 16:20	15	✓	Learning to Pay Multiple Attention with Fully Convolutional Transformers <i>Samuel Oforu Mensah</i>	Samuel Oforu Mensah, Bubacarr Bah and Willie Brink
16:20 - 16:35	15		Applying Route Optimisation to Fair Rota Generation for Home-Help Services <i>Richard Booth</i>	Naomi Davidson and Richard Booth
16:35 - 16:55	20	✓	Self-Supervised Text Style Transfer with Rationale Prediction and Pretrained Transformers <i>Neil Sinclair</i>	Neil Sinclair and Jan Buys
16:55 - 17:00			Session Wrap Up	
19:00			CONFERENCE DINNER AT WATERFORD WINE ESTATE	

Thursday, 8 December 2022 | Main Conference | Day Two

07:30 - 08:25	Registration Tea & Coffee	
08:25 - 08:30	Welcome	
08:30 - 09:30	Prof. Kanshukan Rajaratnam, Director of the School for Data Science and Computational Thinking, Stellenbosch University	
Session Chair: Anban Pillay, University of KwaZulu-Natal		
Time Online		Thursday 8 December
09:30 - 09:50	20	Fine-tuned Self-Supervised Speech Representations for Language Diarization in Multilingual Code-Switched Speech <i>Geoffrey Frost</i>
		Geoffrey Frost, Emily Morris, Joshua Jansen van Vuren & Thomas Niesler
09:50 - 10:10	20	TransFusion: Transcribing Speech with Multinomial Diffusion <i>Herman Kamper</i>
		Matthew Baas, Kevin Eloff and Herman Kamper
10:10 - 10:30	20	Spatial-Temporal Graph Neural Networks For Weather Prediction in South Africa <i>Mikhail Davidson</i>
		Mikhail Davidson and Deshendra Moodley
10:30 - 10:45	15	Breast Cancer Molecular subtyping using Deep learning and multi-omics dataset <i>Dassen Sathan</i>
		Dassen Sathan and Shakuntala Baichoo
10:45 - 11:00	Prof Thomas Meyer, CAIR, Introducing IJCAI 2023, the 32nd International Joint Conference on Artificial Intelligence, Cape Town, 19 to 25 August 2023	
11:00 - 11:05	Session Wrap Up	
11:05 - 11:35	Tea & Coffee Refreshments	
Session Chair: Edgar Jembere, University of KwaZulu-Natal		
Time Online		Thursday 8 December
11:35 - 11:50	15 ✓	Exploring the effectiveness of surrogate-assisted evolutionary algorithms on the batch processing problem <i>Mohamed Variawa</i>
		Mohamed Variawa, Terence Van Zyl and Matthew Woolway
11:50 - 12:05	15 ✓	Comparing Synthetic Tabular Data Generation Between a Probabilistic Model and a Deep Learning Model for Education Use Cases <i>Herkulaas Combrink</i>
		Herkulaas Combrink, Vukosi Marivate and Benjamin Rosman
12:05 - 12:25	20	Jacobian norm regularisation and conditioning in neural ODEs <i>Shane Josias</i>
		Shane Josias and Willie Brink
12:25 - 12:45	20	Cauchy Loss Function: Robustness Under Gaussian and Cauchy Noise <i>Thamsanqa Mlotshwa</i>
		Thamsanqa Mlotshwa, Heinrich van Deventer and Anna Sergeevna Rosman
12:45 - 13:05	20	The missing margin: How sample corruption affects distance to the boundary measurements in ANNs <i>Marthinus Wilhelmus Theunissen</i>
		Marthinus Wilhelmus Theunissen, Coenraad Mouton and Marelise Davel
13:05 - 13:10	Session Wrap Up	
13:10 - 14:10	Lunch	

Session Chair: Marelle Davel, North-West University

Time | Online

Thursday | 8 December

14:10 - 14:30	20	Neural speech recognition for whale call detection <i>Edrich Fourie</i>	Edrich Fourie, Marelle Davel and Jaco Versfeld
14:30 - 14:50	20	Multi-Modal Recommendation System with Auxiliary Information <i>Mufhumudzi Muthivhi</i>	Mufhumudzi Muthivhi, Terence L van Zyl and Hairong Wang
14:50 - 15:10	20	Evaluating Automated and Hybrid Neural Disambiguation for African Historical Named Entities <i>Jarryd Dunn</i>	Jarryd Dunn and Hussein Suleman
15:10 - 15:15		Session Wrap Up	
15:15 - 15:45		Tea & Coffee Refreshments	
Session Chair: Bruce Watson , Stellenbosch University			
Time Online		Thursday 8 December	
15:45 - 16:05	20	Real Time In-Game Playstyle Classification Using A Hybrid Probabilistic Supervised Learning Approach <i>Lindsay John Arendse</i>	Lindsay John Arendse, Branden Ingram and Benjamin Rosman
16:05 - 16:25	20	Towards a methodology for addressing missingness in datasets, with an application to demographic health datasets <i>Gift Khangamwa</i>	Gift Khangamwa, Terence van Zyl, and Clint van Alten
16:25 - 16:45	20	From GNNs to Sparse Transformers: Graph-based architectures for Multi-hop Question Answering <i>Shane Acton</i>	Shane Acton and Jan Buys
16:45 - 17:05	20	Defeasible Justification Using the KLM Framework <i>Steve Wang</i>	Steve Wang, Tommie Meyer and Deshen Moodley
17:05 - 17:15		Session Wrap Up	

Friday, 9 December 2022 | Main Conference | Day Three

07:30 - 08:25	Registration Tea & Coffee	
08:25 - 08:30	Welcome	
08:30 - 09:30	Prof Tshildzi Marwala, Vice-chancellor & Principal of the University of Johannesburg "AI in South Africa"	
<i>Session Chair: Terence van Zyl, University of Johannesburg</i>		
Time Online		Friday 9 December
09:30 - 09:50	20	CASA: Cricket Action Similarity Assessment in video footage using deep metric learning <i>Tevin Moodley</i>
		Tevin Moodley and Dustin Van Der Haar
09:50 - 10:10	20	Improving Cause-of-Death Classification from Verbal Autopsy Reports <i>Thokozile Manaka</i>
		Thokozile Manaka, Terence Van Zyl and Deepak Kar
10:10 - 10:30	20	Adversarial Training for Channel State Information Estimation in LTE Multi-Antenna Systems <i>Andrew Oosthuizen</i>
		Andrew Oosthuizen, Albert Helberg and Marelle Davel
10:30 - 10:50	20	Adaptive Reasoning: An Affect Related Feedback Approach for Enhanced E-learning <i>Christine Asaju</i>
		Christine Asaju and Hima Vadapalli
10:50 - 11:10	20	Content-based medical image retrieval using a class similarity-aware cross-entropy loss <i>Anicet Hounkanrin</i>
		Anicet Hounkanrin, Paul Amayo and Fred Nicolls
11:10 - 11:15	Prof Thomas Meyer, message from our sponsor Centre for Artificial Intelligence Research (CAIR)	
11:15 - 11:20	Session Wrap Up	
11:20 - 11:50	Tea & Coffee Refreshments	
<i>Session Chair: Deshen Moodley, University of Cape Town</i>		
Time Online		Friday 9 December
11:50 - 12:05	15	How Machine Learning Can Aid South African Farmers' Security: Unsupervised Livestock Trajectory Embeddings <i>Urs de Swardt</i>
		Urs de Swardt and Herman Kamper
12:05 - 12:20	15	Afrikaans Text Embeddings for Sequence Labelling with Deep Neural Networks <i>Roald Eiselen</i>
		Roald Eiselen
12:20 - 12:35	15 ✓	Statistics and Deep Learning-based Hybrid Model for Interpretable Anomaly Detection <i>Thabang Mathonsi</i>
		Thabang Mathonsi and Terence Van Zyl
12:35 - 12:50	15 ✓	Volatility forecasting using Deep Learning and sentiment analysis <i>Vuyo Ncume</i>
		Vuyo Ncume, Terence van Zyl and Andrew Paskaramoorthy
12:50 - 13:05	15 ✓	Public Parking spot Detection And Geo-localization Using Transfer Learning <i>Moseli Mots'Oehli</i>
		Moseli Mots'Oehli and Yao Chao Yang
13:05 - 13:40	Conference Closing & Announcement of SACAIR2023 Dr Alta de Waal, University of Pretoria Co-chairperson SACAIR 2022 Local Organising Committee	
13:40 - 14:40	Lunch	