

# Boosting (Sub)Seasonal Forecasts with Explainable AI

5 - 9 September 2022, Leiden, the Netherlands

## Scientific Organizers

- Dim Coumou, Vrije Universiteit Amsterdam
- Maurice Schmeits, Royal Netherlands Meteorological Institute (KNMI)
- Daniela Domeisen, ETH-Zurich & University of Lausanne, Switzerland
- Jakob Runge, DLR Institute of Data Science
- Michael Scheuerer, Norwegian Computing Center

## Topics

- Machine Learning & Technological Pitfalls
- eXplainable AI methods and What They Can Offer for the S2S Climate Community
- Drought in Africa (Case-Study)



The Lorentz Center organizes international workshops for researchers in all scientific disciplines. Its aim is to create an atmosphere that fosters collaborative work, discussions and interactions. For registration see: [www.lorentzcenter.nl](http://www.lorentzcenter.nl)

This workshop is part of the NLeSC-Lorentz program, stimulating multi-disciplinary and data-intensive research in the Netherlands by developing and applying eScience

The promise of AI is seen by scientists and end-users alike. Translating the downpour of new methods into actionable drought forecasts is the next challenge. Photo's by Mike\_Kiev / Red Charlie. Poster design: SuperNova Studios, NL

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## Monday 5 September

9:00 AM	9:30 AM	
9:30 AM	10:00 AM	
10:00 AM	10:30 AM	Lorentz center: Word of Welcome
10:30 AM	11:00 AM	Dim Coumou – What are we gonna do this week?
11:00 AM	11:30 AM	COFFEE
11:30 AM	12:00 PM	Zewdu Segele – What do stakeholders in Horn of Africa need? <b>[ONLINE]</b>
12:00 PM	12:30 PM	Chris Funk – What are the processes behind drought predictability in HoA?
12:30 PM	1:00 PM	Tim Busker – How good are drought forecasts from dynamical models?
1:00 PM	1:30 PM	LUNCH
1:30 PM	2:00 PM	
2:00 PM	2:30 PM	Daniela Domeisen – How can AI methods help for S2S forecasting? <b>[ONLINE]</b>
2:30 PM	3:00 PM	Elena Rangelova – DIANNA+: Using explainable AI to advance science
3:00 PM	3:30 PM	ALL PARTICIPANTS: 2 minute pitches 1 slides on yourself, 1 slide on your work
3:30 PM	4:00 PM	
4:00 PM	4:30 PM	Clarify Team composition & collaboration (WITH COFFEE)
4:30 PM	5:00 PM	Sem Vijverberg - AI4S2S: A community code for AI-based S2S forecasting
5:00 PM	5:30 PM	Sarah Alidoost - AI4S2S: ESMvaltool, a succesfull Open Source Software
5:30 PM	6:00 PM	Wine & Cheese Party



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## Tuesday 6 September

9:00 AM	9:30 AM	Maria Pyrina & Zheng Wu – Using LSTM networks in S2S forecasting
9:30 AM	10:00 AM	Michael Scheuerer – CNN-based postprocessing for S2S forecasting
10:00 AM	10:30 AM	Sem Vijverberg – Causal Precursor Detection for S2S forecasting
10:30 AM	11:00 AM	BREAK OUT SESSIONS: BRAINSTORMING (WITH COFFEE)
11:00 AM	11:30 AM	
11:30 AM	12:00 PM	Team 1: Coding strategy + feedback from eScience
12:00 PM	12:30 PM	Team 2: Coding strategy + feedback from eScience
12:30 PM	1:00 PM	Team 3: Coding strategy + feedback from eScience
1:00 PM	1:30 PM	LUNCH
1:30 PM	2:00 PM	
2:00 PM	2:30 PM	Aaron Spring & Niclas Rieger - AI4S2S: Climpred & xeofs
2:30 PM	3:00 PM	BREAK OUT SESSIONS: CODING
3:00 PM	3:30 PM	
3:30 PM	4:00 PM	COFFEE
4:00 PM	4:30 PM	BREAK OUT SESSIONS: CODING
4:30 PM	5:00 PM	
5:00 PM	5:30 PM	All teams: Short report & sharing information, data, methods
5:30 PM	6:00 PM	FREE



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## Wednesday 7 September

9:00 AM	9:30 AM	Maurice Schmeits – Skill of (East-)African S2S-NWP forecasts of precipitation
9:30 AM	10:00 AM	Chiem van Straaten – Postprocessing European summer forecasts using XAI
10:00 AM	10:30 AM	Jakob Runge – XAI, its limitations, and causal inference in climate science
10:30 AM	11:00 AM	DIANNA team - Generic and climate demo of DIANNA
11:00 AM	11:30 AM	COFFEE
11:30 AM	12:00 PM	All teams: plans for today, RSE feedback
12:00 PM	12:30 PM	BREAK OUT SESSIONS: CODING
12:30 PM	1:00 PM	
1:00 PM	1:30 PM	LUNCH
1:30 PM	2:00 PM	
2:00 PM	2:30 PM	Yang Liu - AI4S2S: S2S use cases from community
2:30 PM	3:00 PM	BREAK OUT SESSIONS: CODING
3:00 PM	3:30 PM	
3:30 PM	4:00 PM	COFFEE
4:00 PM	4:30 PM	BREAK OUT SESSIONS: CODING
4:30 PM	5:00 PM	
5:00 PM	5:30 PM	All teams: Short report & sharing information, data, methods
5:30 PM	6:00 PM	DINNER



## Thursday 8 September

9:00 AM	9:30 AM	FREE
9:30 AM	10:00 AM	DIANNA team - Hands-on exercise with DIANNA & DIANNA+
10:00 AM	10:30 AM	AI4S2S: OPEN DISCUSSION
10:30 AM	11:00 AM	
11:00 AM	11:30 AM	COFFEE
11:30 AM	12:00 PM	All teams: plans for today, RSE feedback
12:00 PM	12:30 PM	BREAK OUT SESSIONS: CODING
12:30 PM	1:00 PM	
1:00 PM	1:30 PM	LUNCH
1:30 PM	2:00 PM	
2:00 PM	2:30 PM	Jannes v Ingen - AI4S2S: Best practices for AI & OSS
2:30 PM	3:00 PM	BREAK OUT SESSIONS: CODING
3:00 PM	3:30 PM	
3:30 PM	4:00 PM	COFFEE
4:00 PM	4:30 PM	BREAK OUT SESSIONS: CODING
4:30 PM	5:00 PM	
5:00 PM	5:30 PM	All teams: Short report & sharing information, data, methods
5:30 PM	6:00 PM	FREE



## Friday 9 September

9:00 AM	9:30 AM	Team 1: Results, next steps, paper
9:30 AM	10:00 AM	Team 2: Results, next steps, paper
10:00 AM	10:30 AM	Team 3: Results, next steps, paper
10:30 AM	11:00 AM	Chris Funk & Zewdu Segele – Reflections & Outlook
11:00 AM	11:30 AM	COFFEE
11:30 AM	12:00 PM	Organizers: Wrap up & Outlook
12:00 PM	12:30 PM	
12:30 PM	1:00 PM	
1:00 PM	1:30 PM	BOAT TRIP
1:30 PM	2:00 PM	
2:00 PM	2:30 PM	
2:30 PM	3:00 PM	
3:00 PM	3:30 PM	
3:30 PM	4:00 PM	
4:00 PM	4:30 PM	
4:30 PM	5:00 PM	
5:00 PM	5:30 PM	
5:30 PM	6:00 PM	

