Deep neural network models for nowcasting using satellite data

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Research objectives

- Automate the process of nowcasting using machine learning

- Obtain good performance

- Develop robust models

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Existing approaches

- Mostly RNN-based
- This is cumbersome in many ways

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Our approach

- Experiments conducted on 10 days of data, 5 from 2018, 5 from 2020

- Published in DeePSat: A deep learning model for prediction of satellite images for nowcasting purpose – KES 2021, accepted

- Xception-style deep CNN, with (t, t+1) pairs, (t+1)-t=15 minutes

- A "flat" model

- Decent results for the model type – let's take a look

Our results

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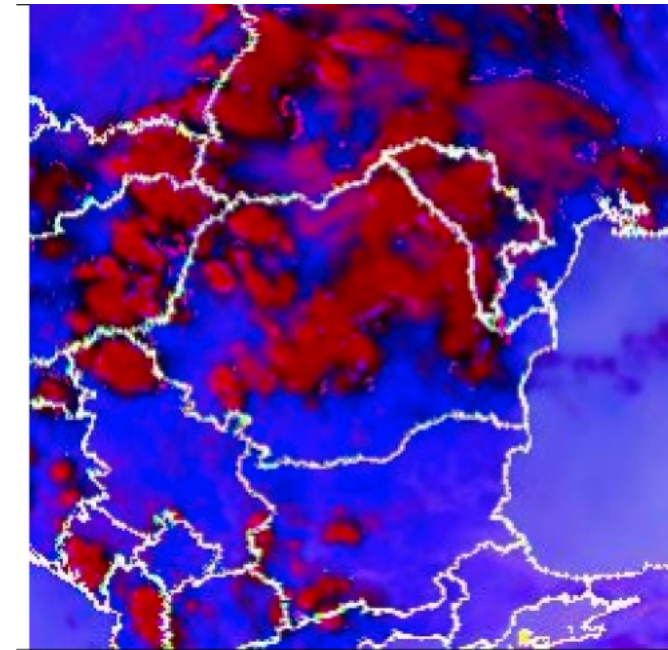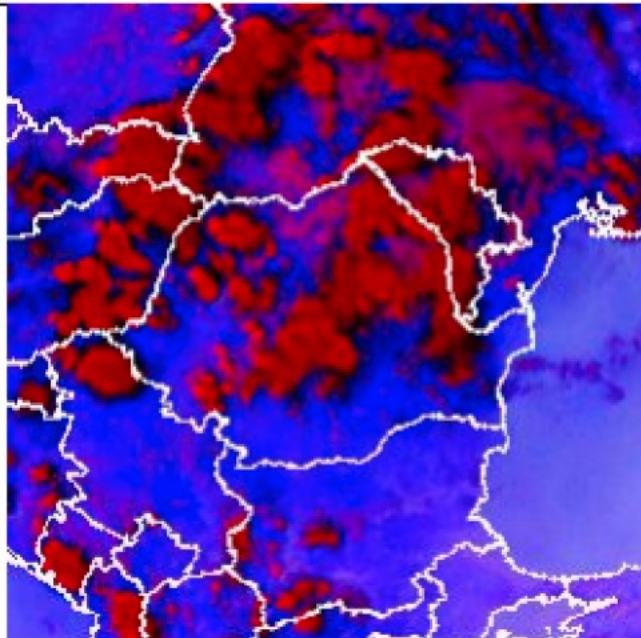
Our results

Model	Evaluation measure	CH_WV62	RGB_0014	RGB_0016	RGB_0017	RGB_0020	Average
DeePSat	MAE	1.464	**13.456**	**9.557**	8.414	**16.006**	**9.779**
	NMAE	0.57%	**5.28%**	**3.75%**	3.30%	**6.28%**	**3.84%**
Baseline CNN	MAE	**1.024**	20.846	11.623	**8.31**	17.281	11.925
	NMAE	**0.40%**	8.17%	4.56%	**3.26%**	6.99%	4.68%

Future work

- RNN-based models still do better
- We want a best of both worlds approach

Q & A