

Long Short-Term Memory (LSTM) Networks for Real-Time Runoff Forecasting using Remotely Sensed Data.

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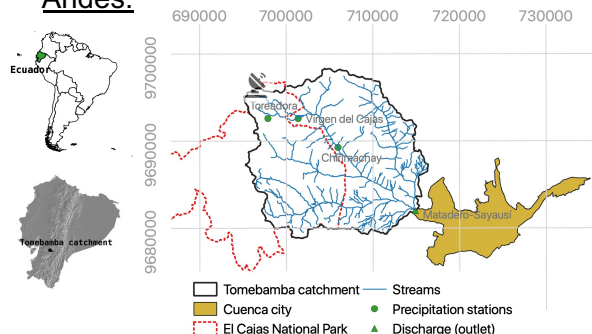
1. Why?

- Lack of truly forecasting systems for cities in the Andes of South America.
- Lack of required relevant data for physically-based forecasting systems.
- Small systems demand **real-time** forecasts.
- Opportunity: Freely-available precipitation **Remote Sensing** products.
- Opportunity: **LSTM networks** are developed for time-series forecasting.



2. Where?

- Cuenca, a medium-size city (0.6 million people), representative of the Tropical Andes.

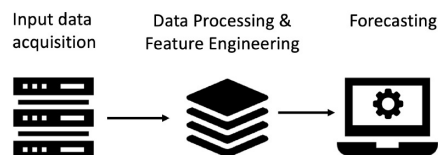


HIGHLIGHTS:

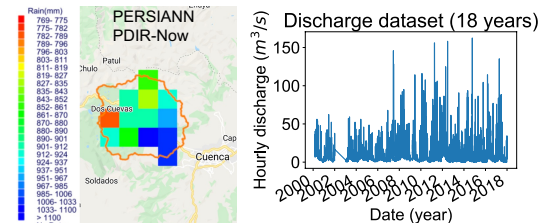
1. **PERSIANN PDIR-Now** product (without ground validation) is a promising data source for hydrological modeling in ungauged regions.
2. **Runoff forecasting systems** powered by **LSTM** networks can be replicated in other Andean cities of South America.

3. How?

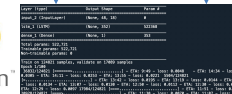
- PERSIANN's PDIR-Now product (0.04° and 1 hour).
- Hourly runoff at the entrance of Cuenca.
- Real-time **data acquisition, processing and forecasting** with LSTM networks.



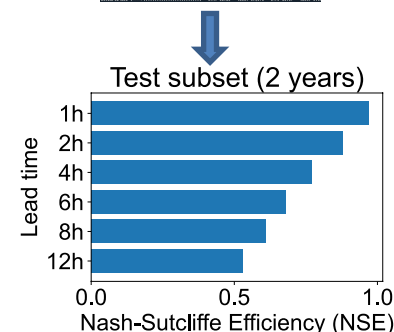
4. Results



python



TensorFlow



5. Future work

- Feature engineering strategies to improve learning process.
- Data fusion of multiple precipitation RS sources.
- Inclusion of precipitation forecasts for extending lead times.

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