



Toward autonomous satellite operations and monitoring using machine learning

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Born at OSCW '18





What is Polaris?

“Python tool for exploring and analyzing telemetry data obtained from the SatNOGS network”



Outline

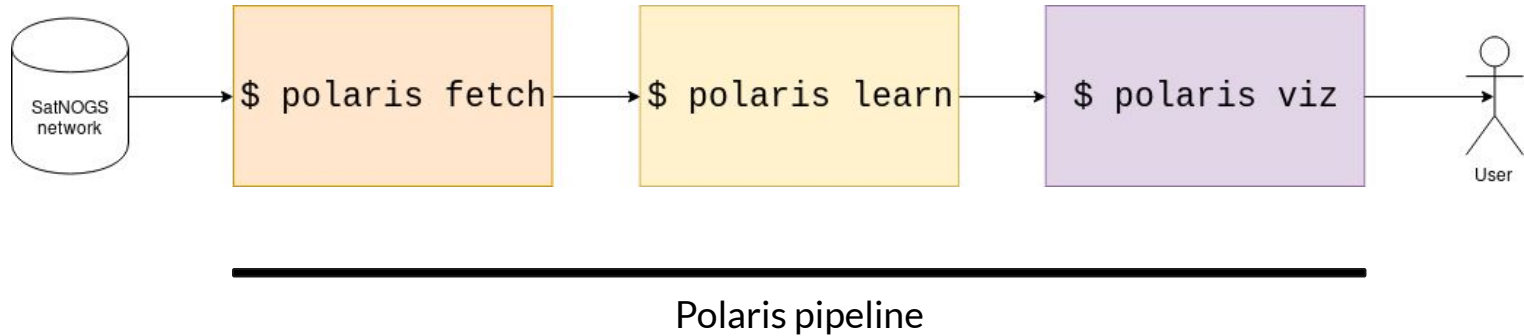
- What is Polaris?
- The project's architecture
- Live demo
- Next steps
- Conclusions



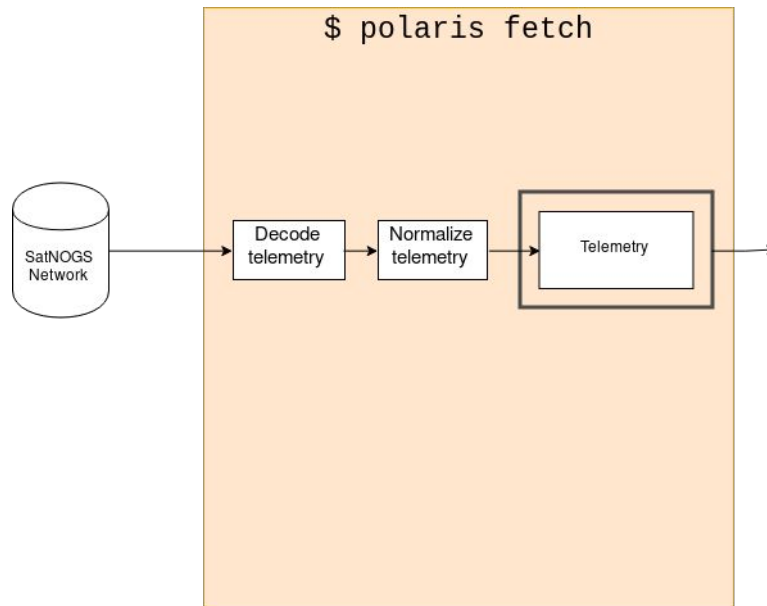
Some figures

- **68** members in Riot
- **352** commits by **7** different contributors
- **48** Merge Requests
- **47** Issues
- **2** summer of code students

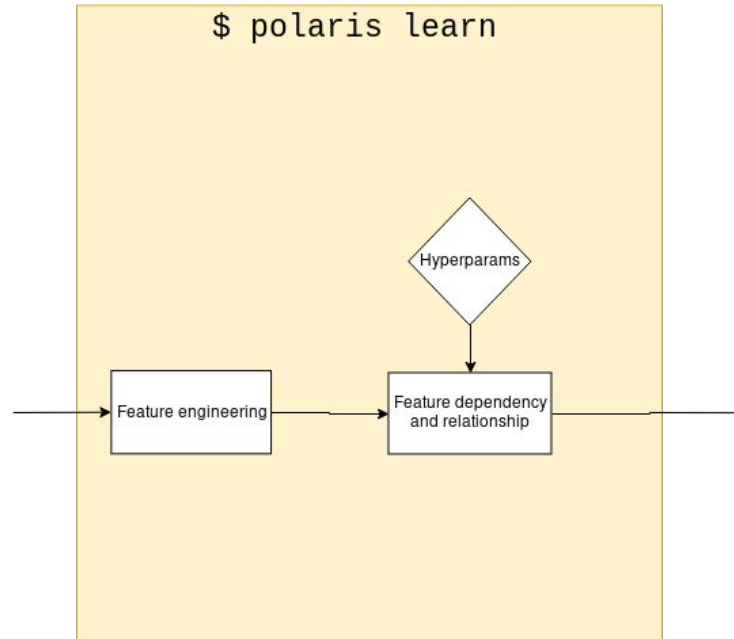
The architecture



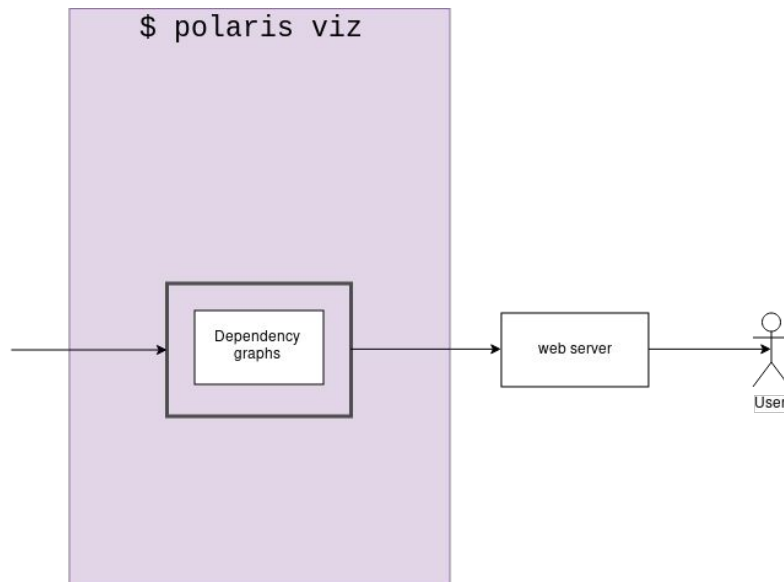
polaris fetch



polaris learn

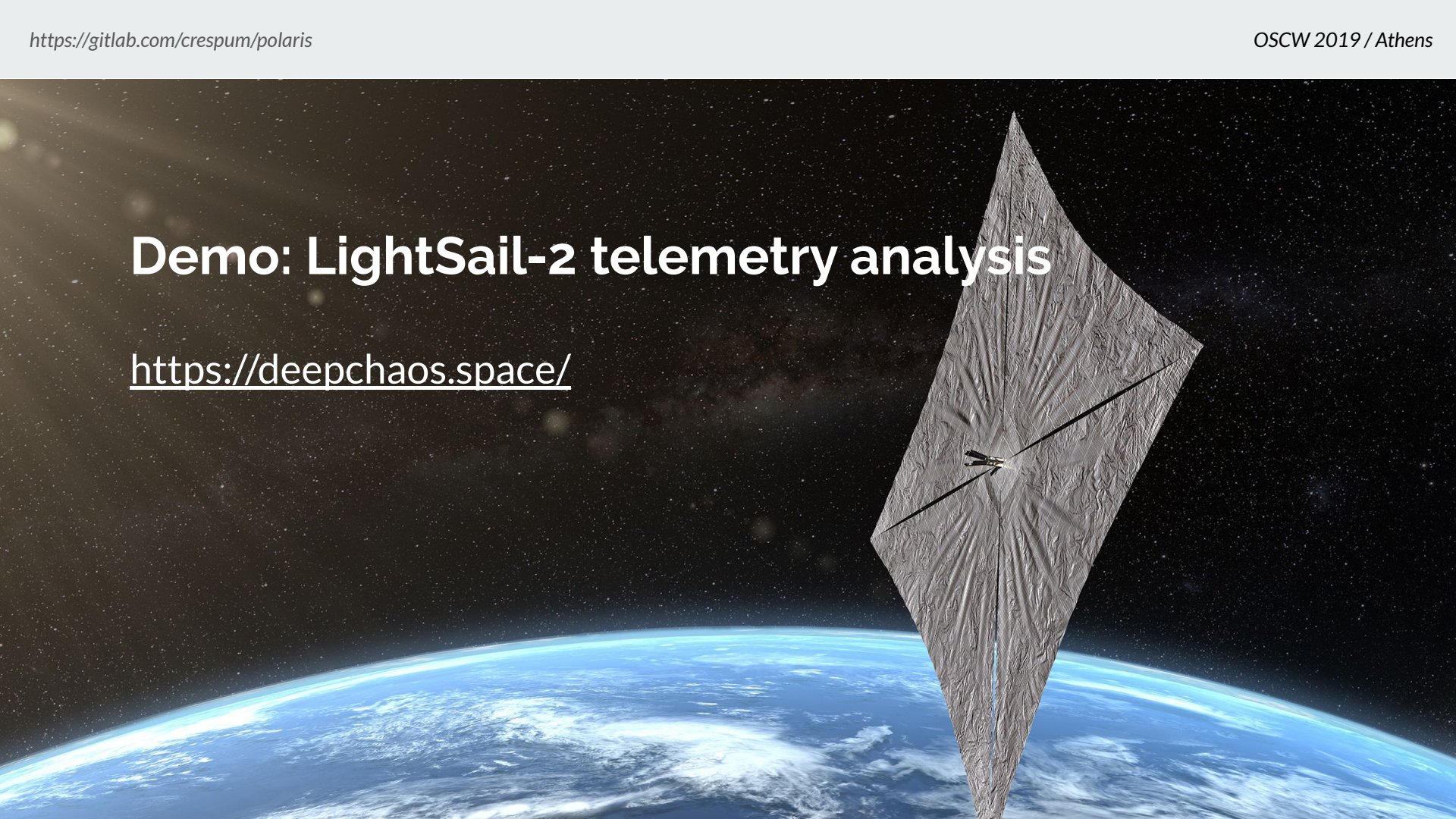


polaris viz

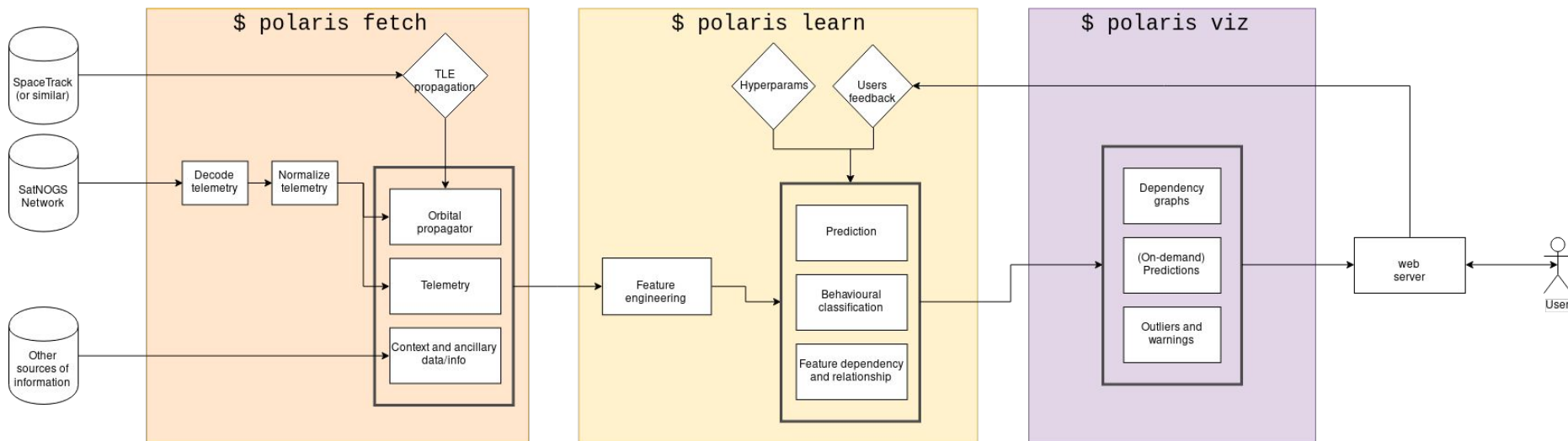


Demo: LightSail-2 telemetry analysis

<https://deepchaos.space/>



Next steps





Conclusions

- We have already found interesting things with fairly simple analysis
- We will need to collaborate with satellite operators to validate the results
- Bigger constellations will yield even better results

“Polaris can be used not only for automating operations, but it can also find deeper relationships and run more complex analysis than what a human would do”



Tips for summer of code projects

- Build a team of mentors
- Be aware of the amount of time required (mentors and students)
- Give students a clear roadmap
- Pick students who had previously collaborated with the project
- Have a good onboarding process



Google
Summer of Code





Special thanks

The team of mentors:

- Redouane Boumghar, Hugh Brown and Patrick Dohmen

The project contributors:

- Aditya Malshikhare, Jan-Peter Ceglarek and Julien Flawinne

The supporting organizations:

- Libre Space Foundation, European Space Agency and Google



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