RISE NEWS secondments

Francesco Di Renzo - 2019

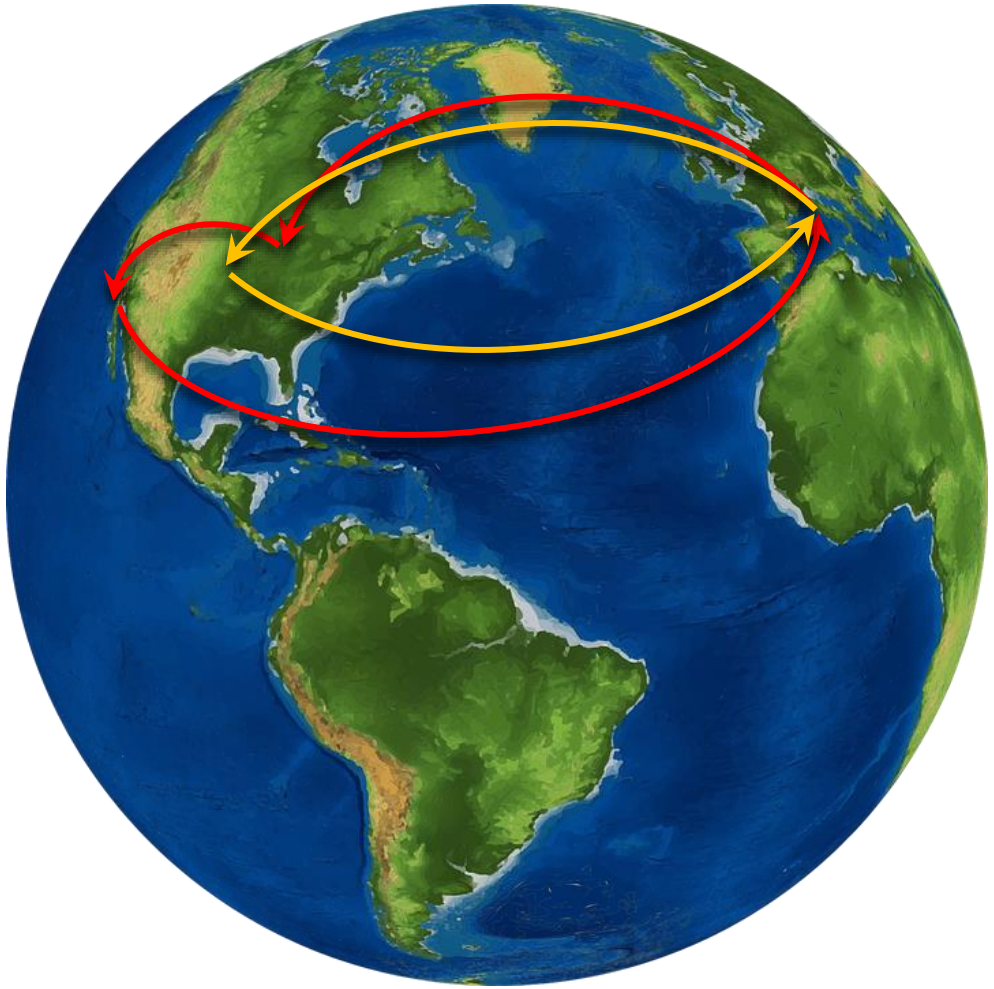
Overview of the secondments

March 2019:

- Lake Geneva, WI
  LIGO-Virgo collaboration meeting

April 2019:

- Caltech, Pasadena, CA
  Research activity, in collaboration with Dr. Vajente

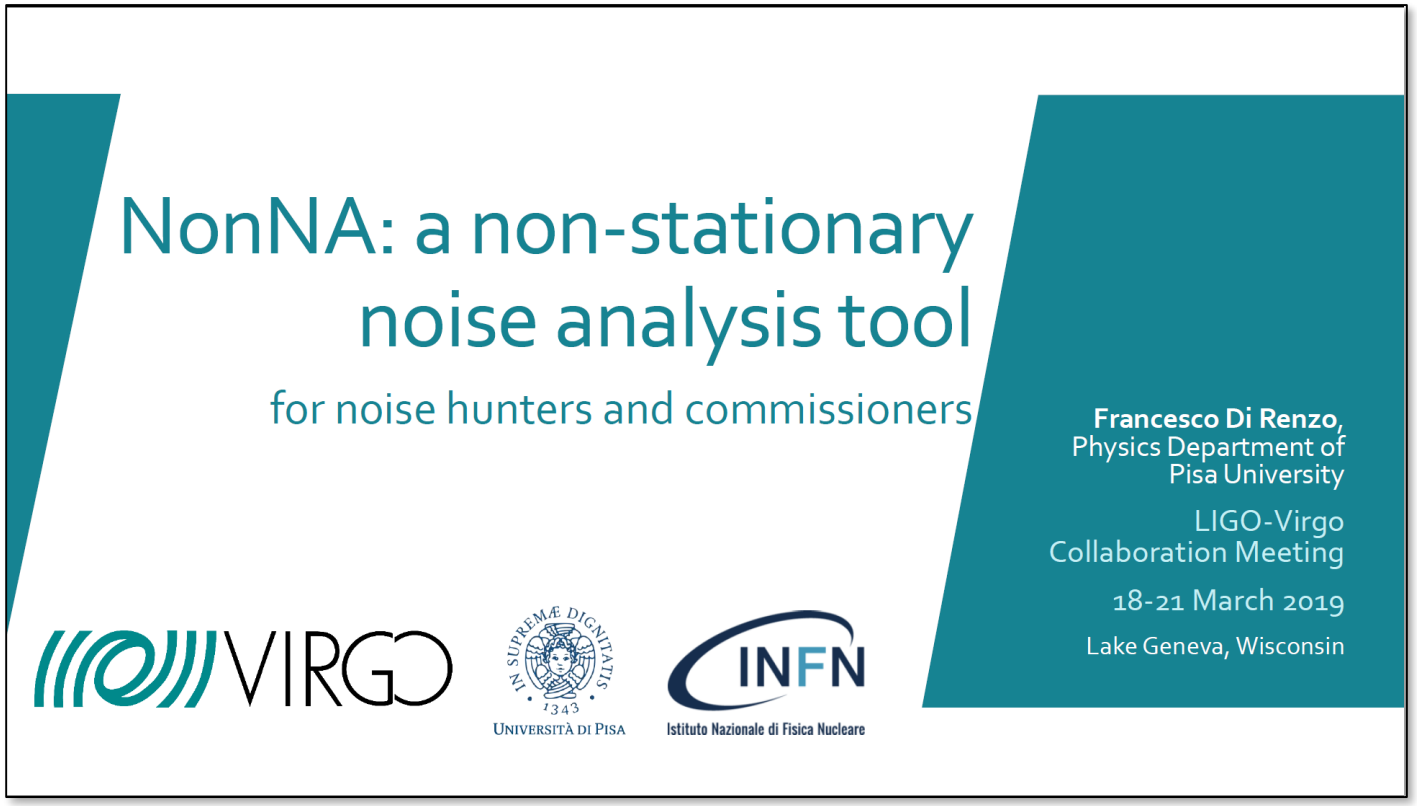


Jul - Aug 2019:

- MS&T, Rolla, MI
  Research activity, in collaboration with Prof. Cavaglia'

LVC meeting – Lake Geneva, WI

Thanks to the RISE NEWS funds, I was able to present my results on non-stationary noise of Virgo at the collaboration meeting, before reaching CALTECH, where I was seconded.

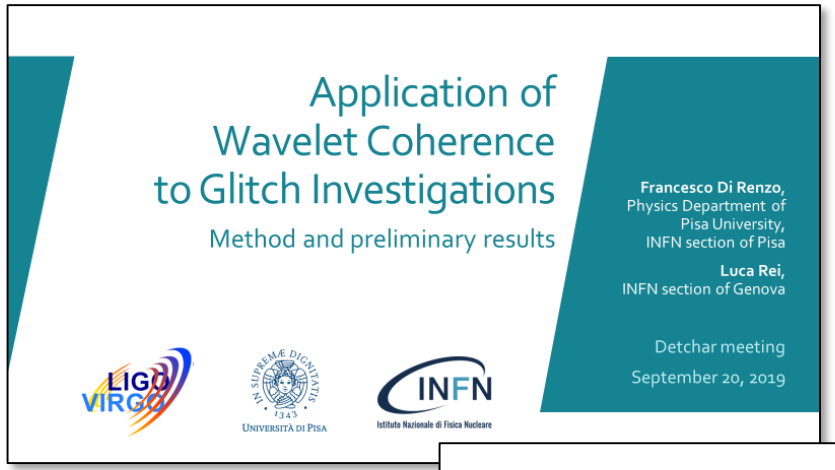


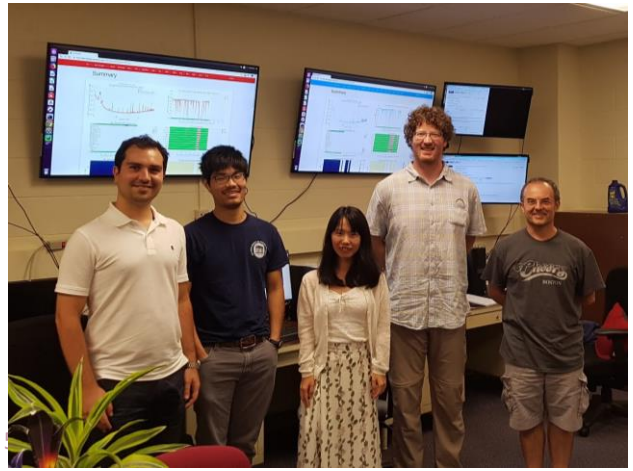
CALTECH – Pasadena, CA

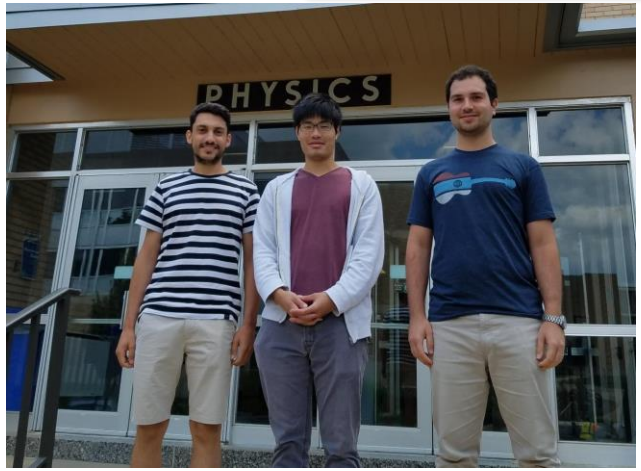
At CALTECH, in collaboration with Dr. Vajente, I refined the analysis tool I was working on.
The results of this work on detector characterization have been presented to the relevant LIGO-Virgo groups.

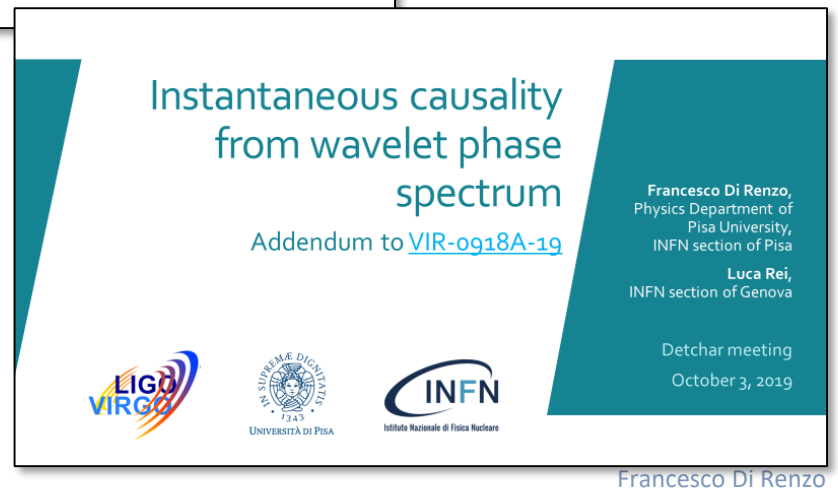
MS&T – Rolla, MI

In Lake Geneva, I met Prof. Cavaglia', who was interested in my research on noise non-stationarities and the study of detector glitches.
Thanks to RISE NEWS I had the chance to visit him and his research group at Missouri University of Science & Technology.





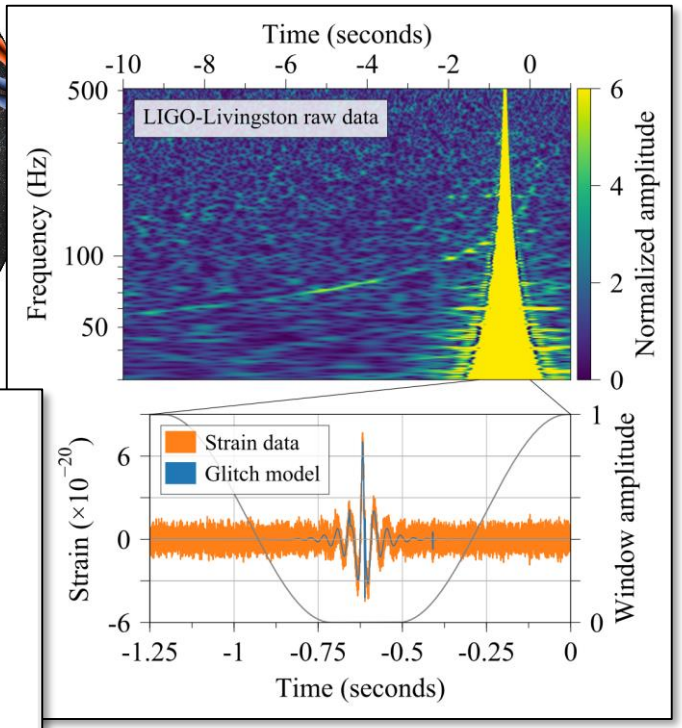


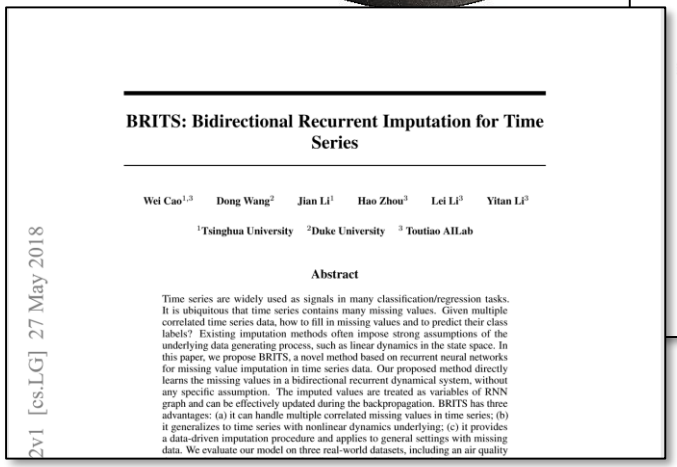


To be continued…

The collaboration with the MS&T group is still active, with the finalization of the projects begun this summer and with some new idea to explore…

Stay tuned!





BRITS: Bidirectional Recurrent Imputation for Time Series

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Abstract

Time series are widely used as signals in many classification/regression tasks. It is ubiquitous that time series contains many missing values. Given multiple correlated time series data, how to fill in missing values and to predict their class labels? Existing imputation methods often impose strong assumptions of the underlying data generating process, such as linear dynamics in the state space. In this paper, we propose BRITS, a novel method based on recurrent neural networks for missing value imputation in time series data. Our proposed method directly learns the missing values in a bidirectional recurrent dynamical system, without any specific assumption. The imputed values are treated as variables of RNN graph and can be effectively updated during the backpropagation. BRITS has three advantages: (a) it can handle multiple correlated missing values in time series; (b) it generalizes to time series with nonlinear dynamics underlying; (c) it provides a data-driven imputation procedure and applies to general settings with missing data. We evaluate our model on three real-world datasets, including an air quality

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Acknowledgments

All the time spent working shoulder to shoulder to develop new analysis algorithms for investigating and mitigating detector noise of Advanced Gravitational-wave detectors wouldn’t have been possible without the financial support of the RISE NEWS project.

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