A Real-Time, Flexible Logging and Monitoring Infrastructure for MonPoly

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1 Introduction

MonPoly [3] is a tool for runtime monitoring, also called Runtime Verification (RV) [1]. Runtime monitoring is a method for checking a systems behaviour against a formal specification during or after execution of the system. If the monitoring happens during execution this is called online monitoring and if it is done after the system is done executing we call this offline monitoring. MonPoly is capable of both forms of monitoring. The monitoring is done on a trace of the system. A trace refers to a timestamped log of events.

We extended MonPoly with a backend written in Python. The backend connects MonPoly to a time series database (QuestDB). It facilitates moving the monitoring from one machine to another and efficiently reload the previous state as long as the database is retained. We do this by making use of relative intervals and only loading events that are within the relative interval of a formula. Further the backend enables a first method for changing the monitored policy.

1.1 Metric First-Order Temporal Logic

MonPoly uses Metric First-Order Temporal Logic (MFOTL) [**Chomicki1995**, 2] as a policy specification language. It can monitor a subset of possible MFOTL formulas. MFOTL is a

1.2 MonPoly

1.3 Time Series Databases

2 Architecture

3 Algorithms

4 Implementation and Evaluation

5 Conclusion

References

[1] Ezio Bartocci et al. *Lectures on Runtime Verification*. Ed. by Ezio Bartocci and Yliès Falcone. Vol. 10457. Springer International Publishing, 2018. ISBN: 978-3-319-75631-8. DOI: 10.1007/978-3-319-75632-5. URL: http://link.springer.com/10.1007/978-3-319-75632-5.

[2] David Basin et al. "Monitoring Metric First-Order Temporal Properties". In: *Journal of the ACM (JACM)* 62 (2 2015), pp. 1–45. ISSN: 0004-5411.

[3] David A Basin, Felix Klaedtke, and Eugen Zalinescu. "The MonPoly Monitoring Tool." In: *RV-CuBES* 3 (2017), pp. 19–28.