

Accepted Manuscript

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PII: S1532-0464(17)30285-X
DOI: <https://doi.org/10.1016/j.jbi.2017.12.015>
Reference: YJBIN 2910

To appear in: *Journal of Biomedical Informatics*

Received Date: 29 June 2017
Revised Date: 23 November 2017
Accepted Date: 28 December 2017

Please cite this article as: Alvarez, C., Rojas, E., Arias, M., Munoz-Gama, J., Sepúlveda, M., Herskovic, V., Capurro, D., Discovering role interaction models in the Emergency Room using Process Mining, *Journal of Biomedical Informatics* (2017), doi: <https://doi.org/10.1016/j.jbi.2017.12.015>

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Discovering role interaction models in the Emergency Room using Process Mining

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Abstract

Objectives: A coordinated collaboration among different healthcare professionals in Emergency Room (ER) processes is critical to promptly care for patients who arrive at the hospital in a delicate health condition, claiming for an immediate attention. The aims of this study are (i) to discover role interaction models in (ER) processes using process mining techniques; (ii) to understand how healthcare professionals are currently collaborating; and (iii) to provide useful knowledge that can help to improve ER processes.

Methods: A four step method based on process mining techniques is proposed. An ER process of a university hospital was considered as a case study, using 7,160 episodes that contains specific ER episode attributes.

Results: Insights about how healthcare professionals collaborate in the ER was discovered, including the identification of a prevalent role interaction model along the major triage categories and specific role interaction models for different diagnoses. Also, common and exceptional professional interaction models were discovered at the role level.

Conclusions: This study allows the discovery of role interaction models through the use of real-life clinical data and process mining techniques. Results show a useful way of providing relevant insights about how healthcare professionals collaborate, uncovering opportunities for process improvement.

Keywords: Healthcare, Processes, Process mining, Case Studies, Organizational Mining, Organizational Team Patterns

1. Introduction

The aim of the Emergency Room (ER) is to assess and treat patients, and provide medical care so they can recover or, at least, alleviate any presented illness or set of symptoms. This can be achieved through standard and well executed processes in the ER, where healthcare professionals collaborate in a systematic manner. Healthcare professionals include physicians, nurses, technicians and other personnel who work together to make quick and accurate decisions

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