

# Machine Learning for Handoffs Classification Based on Effective Communication History

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**Abstract**— An important step in data effective communication in handoffs process analysis is data exploration and representation. Communication in handoff treatment is crucial to protect the patients and it can lead to patient's safety, discontinue care of a patient or the cause loss of important information related to the continuum of care. In this case, we use the machine learning technique by using Support Vector Machine. The aim of this study is to classification the handoffs for twenty weeks to analysis and represented based on the effective communication history. We used handoffs dataset which employed from Arifin Achmad Hospital in Pekanbaru, Indonesia. The result indicated the performance of the designed system was successful and could be used in handoffs analysis based on the effective communication histories in Arifin Achmad Hospital in Pekanbaru, Indonesia.

**Keywords**—machine learning; handoffs; classification; SVM; effective communication

## I. INTRODUCTION

In recent years in effective communication, healthcare has attracted much attention, which is looking for more data analytics in healthcare to relieve medical problems in medical staffage, population, people living alone, and quality of life (Nikpeyma, Abed-saeedi, Azargashb, & Alavi-majd, 2014). Data mining and forecasting play a vital role in modern social and medical fields (Mahdavi, 2013). Ineffective communication is the most frequent cause of side effects in almost all aspects of health services, such as incorrect identification of patients, treatment and blood transfusions, operating procedures, the side to be operated on. These things have the potential to cause incidents of patient safety (Chaboyer, McMurray, Wallis, & Chang, 2008).

In general, the data analysis techniques will be widely used in disease surveillance, decision-making,

health management, and other fields, which focus on current intelligent medical care (Beaumont & Russell, 2012). According to the above discussion, this paper seeks to use a machine learning technique to analysis and represented the handoffs dataset in Arifin Achmad Hospital in Pekanbaru based on treatment or effective communication history.

## II. DATA

The handoffs data were employed from Arifin Achmad Hospital in Pekanbaru, Indonesia. We use handoff patient data which recordings of Arifin Achmad Hospital in Pekanbaru, Indonesia for twenty weeks. The raw data at this paper is the standard metadata exchange formats of Excel.

Distribution the handoff data in Arifin Achmad Hospital in Pekanbaru show in Table 1. In this table, Arifin Achmad Hospital in Pekanbaru is the wide

hospital areas which distribution of handoffs based on effective communication histories.

TABLE 1. HANDOFFS DATA PATIENT IN ARIFIN ACHMAD HOSPITAL IN PEKANBARU, INDONESIA

No	Name	Age	Gender		Education	
			Male	Female	D3	S1
1	201601	57	1	0	1	0
2	201602	41	0	1	0	1
3	201603	46	0	1	0	1
4	201604	37	0	1	1	0
5	201605	48	0	1	1	0
6	201606	36	0	1	1	0
7	201607	38	0	1	1	0
8	201608	42	1	0	1	0
9	201609	23	0	1	0	1
10	201610	32	0	1	1	0
11	201611	32	0	1	1	0
12	201612	42	0	1	1	0
13	201613	31	1	0	1	0
14	201614	45	1	0	1	0
15	201615	40	1	0	0	1

**III. METHOD**

The available handoffs data for twenty weeks in 2016 by using Machine learning technique Classification Model (Artamonov, 2017; Mahdavi, 2013; Mandal, 2012; Meier et al., 2012; Sasirekha & Kumar, 2013). We use action research by look for fifteen participants, with using purposive sampling. We observed and computed the handoffs treatment at data set and observatories on python. We not only used self - report but also focus group discussion to analyze the hand offs data (Beaumont & Russell, 2012; Chaboyer et al., 2008). It provides read/write support the most relevant handoffs and formats. We use the Machine Learning by using SVM (Meier et al., 2012) to classification the handoffs data patient by Classification and to know the distribution of handoffs in the regency of Arifin Achmad Hospital in Pekanbaru, Indonesia.

**IV. RESULT AND DISCUSSION**

Fig. 1 shows the result of handoffs data from machine learning using the Gaussian Support Vector Machine (SVM) on which respectively plotted in classification. The hierarchical handoffs prevalence rate dataset, applied in the simulation, the distribution

of handoffs data patient treatment based on histories show that the new case (1) on green color is more than gave distribution (0) on red color.

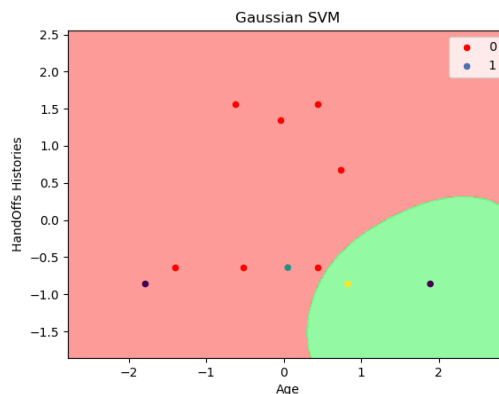


Figure 1. SVM result

In Fig. 1, showed the Gaussian SVM result of Hand Offs data set treatment based on history to indicate the amount of news Hand Offs is fifteen samples.

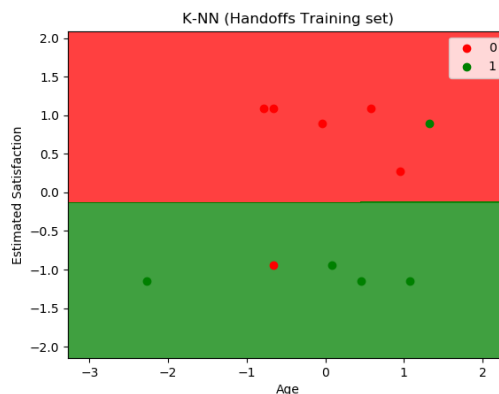


Figure 2. SVM Classification Based on KNN Hand Offs Training Set

Fig. 2 shows the result of the SVM classification model (Sasirekha & Kumar, 2013). The SVM classification of Hand Offs treatment based on histories in Arifin Achmad Hospital in Pekanbaru had been generated to be 20 penalty parameter model with error 0. It was how most Hand Offs improved in the time lapse, and also able to discover a group of Satisfaction in Arifin Achmad Hospital area with a high prevalence of the disease that, far from improving their situation, are increasing the number of cases (Meier et al., 2012).

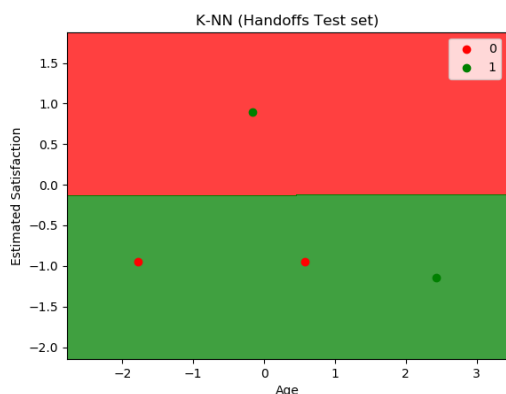


Figure 3. SVM Classification Based on KNN Hand Offs Test Set

The SVM classification of Hand Offs based on Test Set in Fig. 3, showing the estimated satisfaction of the handoffs data between 43 – 54 %. The estimated of this data, was generated by confusing the handoffs training set. From this case, we can analyze the handoffs data, in general, are satisfied.

## V. CONCLUSION AND SUGGESTION

Compare with the previous studies, the classification accuracy obtained by using SVM was better to analysis and presented the Hand Offs treatment based on time series histories in Arifin Achmad Hospital, Indonesia. The result indicated the performance of the designed system was successful and could be used in Handoffs treatment analysis based on the histories in Arifin Achmad Hospital has perceived as effective to combine and using The Situation, Background, Assessment, and Recommendation (SBAR) model. The effective communication had been possible to increase the treatment based on the histories of handoffs data set.

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