

**Ministry of Higher Education and
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Feature Selection For Smart Home Design Using Machine Learning

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Abstract

Internet of Things (IoT) for environmental applications such as smart homes, campuses, cities, and health care systems are used to connect various wireless devices. Despite the use of the same devices, the reusability of these applications enables developers and software engineers to make enhancements to the development process according to the requirements of end users. However, the large number of variations in IoT technologies makes it hard for the developers or software engineers to select the default features in each application because of compatibility issues among devices. In this thesis, approach is proposed to design and manage the variabilities and commonalities among smart home applications.

A feature selection mechanism is proposed to classify the services by selecting the optimal subset features. The dataset is generated using open smart home simulator (Open SHS) for daily activities within the virtual environment. The subset of features is evaluated by the level of consistency in each service.

Weka data mining tool is used to find classifier in terms of Bayes Net, ZeroR, OneR, Naive Bayes, Jrip algorithms. and Decision Table. and Correlation based Feature Selection (CFS) algorithms, Wrapper Subset Eval to find the best features.

It was found that the Bayesian network algorithm and the Decision Table achieve the best accuracy in the data set obtained in order to support services for residents in smart home applications. The approach adopted is based

on a set of predefined performance metrics, such as TP rate, FP rate, accuracy, recall, and F-measurement. And compare the results for each classifier in terms of its ability to rate services. It was found that the Bayes network achieves an accuracy of 84.0% while the decision table achieves an accuracy of 83.0%. while the ZeroR achieves an accuracy of 0.579 %. while the OneR achieves an accuracy of 0.776%. while the NaiveBayes achieves an accuracy of 0.835%. while the Jrip achieves an accuracy of 0.84%.



وزارة التعليم العالي والبحث العلمي
جامعة الموصل
كلية علوم الحاسوب والرياضيات
قسم البرمجيات

اختيار الميزات لتصميم المنزل الذكي باستخدام التعلم الآلي

رسالة مقدمة

الى مجلس كلية علوم الحاسوب والرياضيات في جامعة الموصل
كجزء من متطلبات نيل شهادة ماجستير علوم في
البرمجيات

من قبل

منار مزاحم علاوي الشاهري

بإشراف

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