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| **Data Extraction Form** | | | | | | | | | | | | | | | | | | | | | | |
| **Title** | Phrase-Based Extraction of User Opinions in Mobile App  Reviews | | | | | | | | | | **Authors(s)** | | Phong Minh Vu, Hung Viet Pham, Tam The Nguyen, Tung Thanh Nguyen | | | | | | | | | |
| **Year** | 2016 | | | | | | | | | | **Venue** | | * **Journal** | | * Conference | | | | * Other \_\_\_\_\_\_\_\_\_\_ | | | |
| **Quality Assessment criteria** | | | | * **QC1** | | | | * **QC2** | | | | | * **QC3** | | * **QC4** | | | | * **QC5(Partial)** | | | * QC6 |
| **Inclusion Criteria** | | | | * IC1 | | | | * **IC2** | | | | | * **IC3** | | | * **IC4** | | | * IC5 | | | |
| **Exclusion Criteria** | | | | * EC1 | | | * EC2 | | * EC3 | | | | * EC4 | * EC5 | | | | * EC6 | | * EC7 | | |
| **Approach Used**   * Supervised Machine Learning algorithms * **Unsupervised Machine Learning algorithms(Clustering)** * Natural language processing * Deep Learning algorithms * **Data mining based techniques (Mine the review based on phrases)** * Other | | | | | | | | | | **Type of Solution** | | | | | | | **Yes** | | **No** | | **Unclear** | |
| Novel Technique (Method, Tool, Technique) | | | | | | | Check mark, Wingdings font, character code 252 decimal. | |  | |  | |
| Evaluation of existing techniques  (Evaluation framework, tool, platform) | | | | | | | Check mark, Wingdings font, character code 252 decimal. | |  | |  | |
| Supporting techniques | | | | | | | Check mark, Wingdings font, character code 252 decimal. | |  | |  | |
| **Review dataset** | | **Total number of apps** | | | | 120 | | | | **Evaluation Method Used** | | | | | | | precision, recall | | | | | |
| **Total number of crawled reviews** | | | | 2944335 | | | |
| **Year** | | | | Jan 1 to Sep 30 2015 | | | |
| **Research Type Facet**   * Validation Research * **Evaluation Research** * Solution Proposal * Philosophical Papers * Opinion Papers * Experience Papers | | | | | **Solution Type**   * **Single** * Hybrid/Integrated | | | | | | | **Contribution**   * **Technique** * Tool * Comparison * Model * Framework * Prototype * Taxonomy | | | | | | | | | | |
| **Features used**   * Categorical * **Textual** * Both. | | | | | | |
| **Factors Considered** | | | User opinions in reviews, phrases from reviews | | | | | | | | | | | | | | | | | | | |
| **Notes** | | |  | | | | | | | | | | | | | | | | | | | |
| **Limitations** | | | * Approach cannot extract opinions corresponding to textual expressions * No classification and categorization of bugs * Limited to user opinions only | | | | | | | | | | | | | | | | | | | |
| **Description / Summary** | | | PUMA, an auto-mated, phrase-based approach to extract user opinions in app reviews. This approach includes a technique to extract phrases in reviews using part-of-speech (POS) templates; a technique to cluster phrases having similar meanings (each  cluster is considered as a major user opinion); and a technique to monitor phrase clusters with negative sentiments for their outbreaks over time. They used PUMA to study two popular apps and found that it can reveal severe problems of those apps reported in their user reviews. | | | | | | | | | | | | | | | | | | | |