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| **ID\_ART** | **Authors** | **Title** | **Year** | **Abstract** |
| 1 | Jati H., Irmawati D., Utami P., Destiana B., Sukirman, Hariyanto D. | Development of an online assessment based on the Shareable Content Object Reference Model (SCORM) to optimize the use of BeSmart UNY | 2020 | This study aimed at developing an Online Assessment based on the Shareable Content Object Reference Model (SCORM) package. This study focused on: (1) obtaining an online assessment design based on SCORM package for the subject of Medical Instrumentation and Electronics based on needs analysis; (2) examining the functionality of the developed online assessment and (3) analyzing the usability of the developed online assessment. This software development process used the ADDIE development model. The testing stage of this study was conducted to verify and to validate the software. The software verification process was performed with functionality testing by media and material experts, and usability testing by users. The results indicated that: (1) it was obtained the design of an online assessment based on SCORM package for the subject of Medical Instrumentation and Electronics, including an online assessment in Besmart packed with SCORM Packages in the form of quiz integration (multiple-choice, short answer, true or false, drag and drop questions); (2) the functionality testing by material experts with a score of 3.88 and a media expert with a score of 4.16 suggested that the developed online assessment was feasible in the aspect of functionality; (3) usability testing by users achieved the score of 3.88 indicating that the developed online assessment was feasible in the aspect of usability. © Published under licence by IOP Publishing Ltd. |
| 2 | Cajander Å. | Usability and user's health issues | 2020 | Computer supported work is often stressful and inadequate computer systems and poor usability contribute to the problem. Still the work situation, and work environment of users are seldom considered when developing computer systems. Hence, my research focuses on attitudes about and practices for integrating usability and occupational health issues in IT systems development processes to improve the resulting work situation and well-being of users. The overall goal of the research is to impact software development in practice, hence I do research in real life settings with all the irregularities that occur in such projects. © BCS HCI Group Conference: Engage, HCI 2006.All right reserved. |
| 3 | Bekele R., Biru T., Sametinger J., Groher I., Pomberger G., Floyd C. | Adapting ethnography for design research: Lessons learnt from design of mobile systems for rural health care in Ethiopia | 2020 | This paper attempts to address how ethnography can be adapted and customized to design research for software development in resource constrained social settings. Based on the experience from the Technology Enabled Maternal and Child Health Care (TEMACC-Ethiopia) research project, the work reported demonstrates the suitability of a modified ethnography in a design research particularly in mediating the communication between users and programmers, facilitating reflection and communication among users, programmers and stakeholders, transforming field study insights into design artefacts, testing and deploying software tools as well as supporting users in their work places. The practical guidelines that emerged in the course of the research work are presented as lessons learnt. Extending the ethnography to support usability assessment and change management beyond those conducted in this study are also identified for further research. © 40th International Conference on Information Systems, ICIS 2019. All rights reserved. |
| 4 | Barbosa C.P., Belian R.B., de Araújo C.M.T. | Continuing education in the child health handbook: an educational software for primary care1 | 2020 | Objective: To present, the process of development and evaluation of an educational software on the Child Health Handbook proposed for the continuing education of primary care nurses and physicians. Methods: Quantitative study of methodological development. For software development, the following steps were followed: definition of objectives; determination of the target audience; choice of pedagogical and theoretical reference for content; content selection and structuring; software development and evaluation by experts (five nurses and four physicians). All responded to an instrument that included four domains: pedagogical; content; functionality; system presentation and usability. The evaluation criteria were arranged on a Likert-type scale. The percentage of agreement and Content Validity Index were used for the quantitative analysis of the degree of agreement, considering a Content Validity Index cutoff point equal to 0.80. Results: The overall agreement index, calculated by the arithmetic mean of the Contents Validity Index of the evaluated domains, was 0.96, with scores ranging from 0.90 to 1.00. The average percentage of agreement of the experts per domain was 92.86%, with lower agreement in the content (80.95%), presentation, and usability (90.48%) domains. 100% of percentage of agreement was observed in the pedagogical and functionality domains among the evaluated specialists. Conclusion: The percentage of agreement, Content Validity Index and overall agreement index of the Child Health Handbook educational software in the context of primary care disclosed the software adequacy as an educational resource for continuing education of primary care nurses and physicians. Considering the assessed dimensions, it can also be used by other health professionals and undergraduate students. © 2020 |
| 5 | Wang Y., Ijaz K., Yuan D., Calvo R.A. | VR-Rides: An object-oriented application framework for immersive virtual reality exergames | 2020 | Exercise can improve health and well-being. With this in mind, immersive virtual reality (VR) games are being developed to promote physical activity, and are generally evaluated through user studies. However, building such applications is time consuming and expensive. This paper introduces VR-Rides, an object-oriented application framework focused on the development of experiment-oriented VR exergames. Following the modular programming pattern, this framework facilitates the integration of different hardware (such as VR devices, sensors, and physical activity devices) within immersive VR experiences that overlay game narratives on Google Street View panoramas. Combining software engineering and interaction patterns, modules of VR-Rides can be easily added and managed in the Unity game engine. We evaluate the code efficiency and development effort across our VR exergames developed using VR-Rides. The reliability, maintainability, and usability of our framework are also demonstrated via code metrics analysis and user studies. The results show that investing in a systematic approach to reusing code and design can be a worthwhile effort for researchers beyond software engineering. © 2020 John Wiley & Sons, Ltd. |
| 6 | Sik-Lanyi C., Orbán-Mihálykó É. | Accessibility Testing of European Health-Related Websites | 2019 | The current development of the Internet and its growing use make it necessary to satisfy the needs of users with disabilities. The primary objective of this study is to examine healthcare-related websites in nine European countries in order to evaluate the status of their accessibility. Such a detailed statistical comparison has not yet been made in Europe, especially as the present study offers a dual measurement system combining both the application of automated testing software and statistical analysis of user feedback. The study compares 48 websites from Eastern Europe with 51 sites from Western and Northern Europe. The research phase was performed in three steps: firstly by using AChecker, secondly by Nibbler and subsequently followed by user feedback questionnaires evaluated by a group of experts. The overall goal of this study is to determine the most common accessibility problems and to draw site owners’ attention to shortcomings so that they can improve the quality of service of their healthcare-related sites in the future. The investigated European websites are grouped into Eastern and Western–Northern countries. We compared our results from different perspectives and ascertained that no significant differences can be established between the two groups predicated on their respective economic situations. Equally, no correlations were observed while comparing the sizes of web pages in Kbytes, the number of barriers and their Nibbler accessibility scores. Furthermore, there appears to be no correlation between the results of the software tests and the percentage of the elderly population in the respective country. © 2019, The Author(s). |
| 7 | Al Kilani N., Tailakh R., Hanani A. | Automatic Classification of Apps Reviews for Requirement Engineering: Exploring the Customers Need from Healthcare Applications | 2019 | In one year, more than 6.5 million mobile applications have been listed for download on the application stores. That is, they are used by millions (or billions) of users across the world. Users express their daily experience of applications as reviews on those stores. This experience may include reporting bugs, demanding new features, posting feedback with regards to performance, reporting security issues, demanding user interface enhancements, and other needs. Interestingly, reviews could contain valuable information for the interest of application vendors and developers. However, the volume of such data is as huge, that is, traditional searching algorithms may not be efficient in extracting such useful information. Machine learning and data mining techniques are one of the popularly used algorithms to efficiently extracting significant information for Software Requirement Engineering; a key phase in the Software Engineering Life Cycle. In this paper, we experience machine learning algorithms and natural language processing techniques to classify a set of reviews about healthcare-domain applications into multiple types of categories such as bug reports, new feature requests, application performance, and user interface. For this purpose, we could extract more than 7500 reviews of ten different health-related mobile applications. More importantly, those reviews were annotated manually by software experts. In our experiments, we use the Weka tool employing different machine learning algorithms. We will also show what algorithms and features will perform better; in terms of accuracy using different evaluation metrics, when classifying reviews about mobile apps into various classes; bugs, new features, sentimental, general bug, usability, security, and performance. Moreover, the conducted experiments show that the overall performance improves when we use the data subset with highly confident labeling; when two experts agree on the same class. For the imbalanced-data problem, this research will show the effect of applying resampling techniques on improving classification accuracy as well. © 2019 IEEE. |
| 8 | Värri A., Kranz-Zuppan P., De La Cruz R. | IEC 62304 ed. 2: Software life cycle standard for health software | 2019 | The quality of software is high in medical devices due to the strict regulatory requirements and their implementation in the software development processes through the use of the IEC 62304 standard. The goal of this standard revision project was to extend the scope of the standard to all health software and also to bring the requirements of the 12 year old standard back to the state-of-the-art including provisions for cybersecurity. The joint IEC/SC62A and ISO/TC215 project team revised the standard and adapted its risk management, usability, and security requirements to serve both the medical device industry and the overall health software industry. The resulting second version of the standard has gone through a multistage global voting process to achieve a consensus of the requirements to serve both these communities. The resulting standard has potential to have a major impact on the quality of software used in health care globally. © 2019 International Medical Informatics Association (IMIA) and IOS Press. |
| 9 | Ehrler F., Lovis1 C., Blondon K. | A mobile phone app for bedside nursing care: Design and development using an adapted software development life cycle model | 2019 | Background: Nurses are increasingly spending time on computers, and providing them with a tailored tool to access clinical information and perform documentation at the bedside could help to improve their efficiency. Designing an app to support nurses' work at the bedside is a challenging task, given the complexity of the care process. Objective: This study aimed to present the design, development, and testing of a smartphone app for nurses guided by an adapted software development life cycle model that takes into consideration the complexity and constraints of a health care setting. Methods: The model drives us through an iterative development process intersected by 3 stages of formative evaluation of growing ecological validity. Results: The initial requirements identification stage included 11 participants who helped us select the most important functionalities to integrate into the tool. Starting with a usability evaluation allowed for the identification of design issues that could have caused misuse. Then, making on-site evaluations under the supervision of an investigator helped to understand the adequacy of the tool with limited risks. Finally, the on-site evaluation allowed us to validate the acceptance of the app by caregivers. Conclusions: The interpretation of the collected evaluation confirms the necessary involvement of end users early in the process to help address the heterogeneity of the nursing workflow processes in the different wards. We also highlight the delicate balance between high-security measures to protect access to patient data and maintaining ease of access for efficiency and usability. Although a close collaboration with clinicians throughout the entire project facilitated the development of a tailored solution, it was also important to involve all stakeholders, in particular, the information technology (IT) security officers. © 2019 Journal of Medical Internet Research. All rights reserved. |
| 10 | Pinter C., Lasso A., Fichtinger G. | Polymorph segmentation representation for medical image computing | 2019 | Background and objective: Segmentation is a ubiquitous operation in medical image computing. Various data representations can describe segmentation results, such as labelmap volumes or surface models. Conversions between them are often required, which typically include complex data processing steps. We identified four challenges related to managing multiple representations: conversion method selection, data provenance, data consistency, and coherence of in-memory objects. Methods: A complex data container preserves identity and provenance of the contained representations and ensures data coherence. Conversions are executed automatically on-demand. A graph containing the implemented conversion algorithms determines each execution, ensuring consistency between various representations. The design and implementation of a software library are proposed, in order to provide a readily usable software tool to manage segmentation data in multiple data representations. A low-level core library called PolySeg implemented in the Visualization Toolkit (VTK) manages the data objects and conversions. It is used by a high-level application layer, which has been implemented in the medical image visualization and analysis platform 3D Slicer. The application layer provides advanced visualization, transformation, interoperability, and other functions. Results: The core conversion algorithms comprising the graph were validated. Several applications were implemented based on the library, demonstrating advantages in terms of usability and ease of software development in each case. The Segment Editor application provides fast, comprehensive, and easy-to-use manual and semi-automatic segmentation workflows. Clinical applications for gel dosimetry, external beam planning, and MRI-ultrasound image fusion in brachytherapy were rapidly prototyped resulting robust applications that are already in use in clinical research. The conversion algorithms were found to be accurate and reliable using these applications. Conclusions: A generic software library has been designed and developed for automatic management of multiple data formats in segmentation tasks. It enhances both user and developer experience, enabling fast and convenient manual workflows and quicker and more robust software prototyping. The software's BSD-style open-source license allows complete freedom of use of the library. © 2019 Elsevier B.V. |
| 11 | Oplas A., Rabago M.H., Tormes C.L., Romana C.L.S., Laviste R. | Aeon: A smart medicine delivery and inventory system for cebu city government's long life medical assistance program | 2019 | Cebu City government's Long Life Medical Assistance Program aims to deliver and supply maintenance medicine to its qualifying beneficiaries. The process is done manually resulting to certain problems such as: (1) lack of evidences that the beneficiaries received the medicine intended for them; (2) inventory monitoring of medicines distributed; (3) and shortage of medicine supplies. In line with these problems, a web and mobile application called Aeon is designed in partnership with the Cebu City Government's Long Life Medical Assistance Program. The web application efficiently monitors the medicine supplies complemented with predictive restocking notifications to know if an incoming shortage of medicine will occur. In the study, the mobile application utilizes Facial Recognition and Global Positioning System to track and validate deliveries of medicines. The study used Agile Software Development Method in order to deliver the expected outputs. A usability survey was conducted and majority of the respondents are satisfied with the features of the system. Moreover, 87% of the respondents indicated that they prefer using the system over the manual process and would recommend the use of the system for the Long Life Medical Assistance Program. © 2018 IEEE. |
| 12 | Pilco H., Sanchez-Gordon S., Calle-Jimenez T., Pérez-Medina J.L., Rybarczyk Y., Jadán-Guerrero J., Maldonado C.G., Nunes I.L. | An agile approach to improve the usability of a physical telerehabilitation platform | 2019 | The goal of a telerehabilitation platform is to safely and securely facilitate the rehabilitation of patients through the use of telecommunication technologies complemented with the use of biomedical smart sensors. The purpose of this study was to perform a usability evaluation of a telerehabilitation platform. To improve the level of usability, the researchers developed and proposed an iterative process. The platform uses a digital representation of the patient which duplicates the therapeutic exercise being executed by the patient; this is detected by a Kinect camera and sensors in real time. This study used inspection methods to perform a usability evaluation of an exploratory prototype of a telerehabilitation platform. In addition, a cognitive workload assessment was performed to complement the usability evaluation. Users were involved through all the stages of the iterative refinement process. Usability issues were progressively reduced from the first iteration to the fourth iteration according to improvements which were developed and applied by the experts. Usability issues originally cataloged as catastrophic were reduced to zero, major usability problems were reduced to ten (2.75%) and minor usability problems were decreased to 141 (38.74%). This study also intends to serve as a guide to improve the usability of e-Health systems in alignment with the software development cycle. © 2019 by the authors. |
| 13 | Grüning B.A., Lampa S., Vaudel M., Blankenberg D. | Software engineering for scientific big data analysis | 2019 | The increasing complexity of data and analysis methods has created an environment where scientists, who may not have formal training, are finding themselves playing the impromptu role of software engineer. While several resources are available for introducing scientists to the basics of programming, researchers have been left with little guidance on approaches needed to advance to the next level for the development of robust, large-scale data analysis tools that are amenable to integration into workflow management systems, tools, and frameworks. The integration into such workflow systems necessitates additional requirements on computational tools, such as adherence to standard conventions for robustness, data input, output, logging, and flow control. Here we provide a set of 10 guidelines to steer the creation of command-line computational tools that are usable, reliable, extensible, and in line with standards of modern coding practices. © The Author(s) 2019. Published by Oxford University Press. This is an Open Access article distributed under the terms of the Creative Commons Attribution License (http://creativecommons.org/licenses/by/4.0/), which permits unrestricted reuse, distribution, and reproduction in any medium, provided the original work is properly cited. |
| 14 | Martins A.I., Queirós A., Rocha N.P. | Validation of a usability assessment instrument according to the evaluators’ perspective about the users’ performance | 2019 | Technologies for ageing in place may help older adults in their homes to overcome multiple impairments and to promote their autonomy and independence. When conceptualizing technologies for ageing in place, the International Classification of Functioning, Disability and Health (ICF) is a key element due to its functioning and disability framework with consolidated concepts and terminologies. Based on the ICF conceptual framework, the article presents the ICF based Usability Scale (ICF-US) to evaluate the usability of technologies for ageing in place and reports a study aiming: (1) to validate the ICF-US to evaluate usability according to the evaluators’ perspective about the users’ performance and (2) to evaluate the utility and applicability of the ICF-US. Two observational studies evolving 184 participants were conducted to: (1) assess the validity and reliability of the ICF-US to evaluate usability according to the evaluators’ perspective about the users’ performance and (2) to verify the utility and applicability of the ICF-US. The results suggest that the ICF-US is valid and reliable and can be used in different stages of technological developments without losing its discriminatory capacity. © 2019, Springer-Verlag GmbH Germany, part of Springer Nature. |
| 15 | [No author name available] | 7th International Working Conference on Human-Centered Software Engineering, HCSE 2018 | 2019 | The proceedings contain 23 papers. The special focus in this conference is on Human-Centered Software Engineering. The topics include: A visual tool for analysing IoT trigger/action programming; software support for coherent prototyping of 3D gesture interactions; towards tool-support for robot-assisted product creation in fab labs; usability evaluation of model-driven cross-device web user interfaces; absolute indirect touch interaction: Impact of haptic marks and animated visual feedback on usability and user experience; factors affecting the choice of usability evaluation methods for interactive adaptive systems; towards a model to address the interplay between IoT applications and users in complex heterogeneous contexts; user evaluations of virtually experiencing mount everest; early incremental user testing design approach validation for satellite command center’s application; Get realistic! - UCD course design and evaluation; graphical user interface redefinition addressing users’ diversity; Integrating HCD into BizDevOps by using the subject-oriented approach; Intuitive user-centered interaction design for ATV; trade-Off between system effectiveness and context constraints in the design of an iot system giving access to health care in African rural villages; helping teams to help themselves: An industrial case study on interdependencies during sprints; participatory ideation for gamification: Bringing the user at the heart of the gamification design process; a method for optimizing complex graphical interfaces for fast and correct perception of system states; data-driven usability test scenario creation; MIODMIT: A generic architecture for dynamic multimodal interactive systems; adding measures to task models for usability inspection of the cloud access control services. |
| 16 | da Silva G.C., da Silva L.P.F., Jofilsan N.C., Correia W.F.M., Gomes A.S., Campos Filho A.S. | Satisfaction analysis for using educational serious games for teaching wound treatment | 2019 | This article aims to describe the production process of the educational game “treat well!”, idealized for learning in higher education institutions. Research was done with students of the health courses, which helped to prove the direct effect in the improvement of cognitive functions such as memory, attention, perception, among others. The acquired advantages of technology, when well used are unimaginable, especially when used for education. The barriers encountered by this tool to realize its real application were perceptible, but these were worked on and perfected to find a balance between education and fun. We can infer that this tool, when properly applied, is able to attract and perpetuate information in students in any educational field. In this context, an educational game was developed that serves as a support to the learning process of the students of nursing courses. The goal of this research was to analyze the usability and satisfaction of the educational game “Treat Well!” which teaches the treatment of a simple wound with nursing students. For the development of the project, the methodology used was based on software engineering practices, User Centered Design and Usability and Satisfaction Analysis. The study was also based on a qualitative and quantitative approach with exploratory character and also statistical. The qualitative variable used to capture the perception of users in the study was made in an empirical way of observing the search for relevant and convenient data obtained through experience observed. The quantitative variables used to analyze usability were the effectiveness, time of use and user perception through the Attrakdiff questionnaire. The usability test was performed with high fidelity game prototype with 10 volunteers in a college in Recife Brazil. From the results generated we can understand that improvements can be made to a greater identification and interaction of the user with the proposed game. © 2019, Springer International Publishing AG, part of Springer Nature. |
| 17 | Rybarczyk Y., Medina J.L.P., Leconte L., Jimenes K., González M., Esparza D. | Implementation and assessment of an intelligent motor tele-rehabilitation platform | 2019 | Over the past few years, software applications for medical assistance, including tele-rehabilitation, have known an increasing presence in the health arena. Despite the several therapeutic and economic advantages of this new paradigm, it is important to follow certain guidelines, in order to build a safe, useful, scalable, and ergonomic tool. This work proposes to address all these points, through the case study of a physical tele-rehabilitation platform for patients after hip replacement surgery. The scalability and versatility of the system is handled by the implementation of a modular architecture. The safeness and effectiveness of the tool is ensured by an artificial intelligence module that assesses the quality of the movements performed by the user. The usability of the application is evaluated by a cognitive walkthrough method. Results show that the system (i) is able to properly assess the correctness of the human’s motion through two possible methods (Dynamic Time Warping and Hidden Markov Model), and (ii) provides a good user experience. The discussion addresses (i) the advantages and disadvantages of the main approaches for a gesture recognition of therapeutic movements, and (ii) critical aspects to provide the patient with the best usability of a tele-rehabilitation platform. © 2019 by the authors. Licensee MDPI, Basel, Switzerland. |
| 18 | Chugh R., Chawla N., Gracias R.M., Padda J.S., Li S., Nguyen M.T., Spichkova M., Mantri N. | Automated gathering and analysis of cannabinoids treatment data | 2019 | The paper presents an open source platform to integrate and analyse the cannabinoids research data gathered from academic publications, industrial and clinical trials as well as patients. The project focuses on the analysis of the usability aspects important for the applications collecting the treatment data as well as data on diverse cannabinoids strains. The collected data will be used to estimate the efficiency of cannabinoid treatment of various disorders, which will provide an evidence-based assistance for doctors, researchers and industry to identify the right cannabinoid profiles for various conditions. © 2019 The Author(s). Published by Elsevier B.V. |
| 19 | Ouhbi S., Karampela M., Isomursu M. | Integrating users logic into requirements engineering for connected healthcare co-design | 2019 | The ongoing transformation in healthcare requires the creation of agile systems to meet the growing needs of patients. An approach to develop such systems requires the elicitation of end-users' perspectives to software development life circle. The current requirements development process does not emphasis on the importance of end-users' participation in the requirements elicitation phase. The present study proposes an approach utilizing Service-Dominant (S-D) logic framework to contribute to the co-design of connected health services. Value co-creation practices when combined with requirements engineering best practices can contribute towards the development of usable software for connected healthcare systems. Copyright © 2019 by SCITEPRESS - Science and Technology Publications, Lda. All rights reserved |
| 20 | Gama L.N., Tavares C.M.M. | Development and evaluation of mobile application for the prevention of musculoskeletal risks in nursing work [Desenvolvimento e avaliação de aplicativo móvel na prevenção de riscos osteomusculares no trabalho de enfermagem] [Desarrollo y evaluación de una aplicación móvil en la prevención de riesgos osteomusculares en el trabajo de enfermería] | 2019 | Objective: to develop a multi-platform mobile application for the prevention of musculoskeletal risk factors related to nursing work in a hospital unit and to evaluate the usability criteria with nurses and computer professionals. Method: technological production study for the development of a mobile application, following the phases of software engineering: analysis of requirements, design and specification, construction, internal tests, maintenance and external evaluation. The product was evaluated for usability by nurses from public hospital units in the city of Rio de Janeiro (Brazil). The System Usability Scale instrument was used for the evaluation of the nurses and the instrument of heuristics of compliance of digital interfaces was used with the informational technology professionals. The application development period lasted from November 2017 to March 2018 and the usability assessment from March to May 2018. Results: the evaluation data showed that the application shows agreement and compliance with the principles of usability in the criteria of effectiveness, efficiency and user satisfaction, however, the evaluators suggest that the application’s functionalities should be simplified. Conclusion: the application was designed as a care strategy for the nursing professional, considering the musculoskeletal risks which they are exposed to in their professional activities. The development and evaluation methods were satisfactory and the proposed objectives were achieved. © 2019, Universidade Federal de Santa Catarina. All rights reserved. |
| 21 | Ehrler F., Lovis C., Blondon K. | A mobile phone app for bedside nursing care: Design and development using an adapted software development life cycle model | 2019 | Background: Nurses are increasingly spending time on computers, and providing them with a tailored tool to access clinical information and perform documentation at the bedside could help to improve their efficiency. Designing an app to support nurses’ work at the bedside is a challenging task, given the complexity of the care process. Objective: This study aimed to present the design, development, and testing of a smartphone app for nurses guided by an adapted software development life cycle model that takes into consideration the complexity and constraints of a health care setting. Methods: The model drives us through an iterative development process intersected by 3 stages of formative evaluation of growing ecological validity. Results: The initial requirements identification stage included 11 participants who helped us select the most important functionalities to integrate into the tool. Starting with a usability evaluation allowed for the identification of design issues that could have caused misuse. Then, making on-site evaluations under the supervision of an investigator helped to understand the adequacy of the tool with limited risks. Finally, the on-site evaluation allowed us to validate the acceptance of the app by caregivers. Conclusions: The interpretation of the collected evaluation confirms the necessary involvement of end users early in the process to help address the heterogeneity of the nursing workflow processes in the different wards. We also highlight the delicate balance between high-security measures to protect access to patient data and maintaining ease of access for efficiency and usability. Although a close collaboration with clinicians throughout the entire project facilitated the development of a tailored solution, it was also important to involve all stakeholders, in particular, the information technology (IT) security officers. © Frederic Ehrler, Christian Lovis, Katherine Blondon. |
| 22 | Araujo J.L., Sant’Anna H.C., Lima E.F.A., Fioresi M., Nascimento L.C.N., Primo C.C. | Mobile app for nursing process in a neonatal intensive care unit [Aplicativo móvel para o processo de enfermagem em uma unidade de terapia intensiva neonatal] [Aplicación móvil para el proceso de enfermería en una unidad neonatal de cuidados intensivos] | 2019 | Purpose: to develop and validate a nursing process application in a neonatal intensive care unit. Method: a methodological study, conducted in a university hospital in southeastern Brazil from January 2017 to February 2018, divided into four stages: definition of requirements and elaboration of the conceptual model; generation of implementation and prototyping alternatives; testing and implementation. The app was developed based on Wanda Horta’s Basic Human Needs and International Classification for Nursing Practice and following the User Centered Design method and the standards of the Brazilian Association of Software Engineering Technical Standards for IOS and Android platforms. The product was evaluated and validated by nurses for functional suitability, reliability, usability, performance efficiency, compatibility and safety. Results: the CuidarTech Neo Processo de Enfermagem app has screens that integrate the elements for history, diagnosis and nursing interventions. According to the judges’ evaluation, it has functional adequacy, reliability, usability, performance efficiency, compatibility and safety. Conclusion: the app designed and validated by nurses is a computerized instrument that contains the stages of the nursing process: history, diagnoses and interventions, organized by Basic Human Needs and following the taxonomy of the International Classification for Nursing Practices. It relates information of newborns admitted to Neonatal Intensive Care Units and the nursing process, being able to provide quality, effectiveness, safety and personal satisfaction to the nurse’s care. © 2019, Universidade Federal de Santa Catarina. All rights reserved. |
| 23 | Weldon M., Poyade M., Martin J.L., Sharp L., Martin D. | Using Interactive 3D Visualisations in Neuropsychiatric Education | 2019 | Obsessive compulsive disorder (OCD) is a neuropsychiatric disorder with a global prevalence of 2–3%. OCD can have an enormous impact on the lives of those with the disorder, with some studies suggesting suicidal ideation is present in over 50% of individuals with OCD, and other data showing a significant number of individuals attempt suicide. It is therefore important that individuals with OCD receive the best possible treatment. A greater understanding of the underlying pathophysiology of neuropsychiatric disorders among professionals and future clinicians can lead to improved treatment. However, data suggests that many students and clinicians experience “neurophobia”, a lack of knowledge or confidence in cases involving the nervous system. In addition, research suggests that the relationship many students have with neurological conditions deteriorates over time, and can persist into practice. If individuals living with conditions such as OCD are to receive the best possible treatment, it is crucial that those administering care are equipped with a thorough understanding of such disorders. While research has shown that the use of interactive 3D models can improve anatomy education and more specifically neurology education, the efficacy of using of such models to engage with neuropsychiatric conditions, specifically OCD, has not been assessed. This study seeks to address this gap. In this study an interactive application for Android devices was designed using standardised software engineering methods in order to improve neuropsychiatry literacy by empowering self-pace learning through interactive 3D visualisations and animations of the neural circuitry involved in OCD. A pilot test and a usability assessment were conducted among five postgraduate life science students. Findings relating to user experience were promising, and pre-test vs. post-test evaluation suggested encouraging outcomes regarding the effectiveness of the application in improving the knowledge and understanding of OCD. In short, this study suggests that interactive 3D visualisations can improve neuropsychiatry education. For this reason, more efforts should be made to construct similar applications in order to ensure patients always receive the best possible care. Fig. 2.1 © 2019, Springer Nature Switzerland AG. |
| 24 | de Oliveira M.V.L., Geambastiani P., Lopez G., Cambui M., Ubeda C., Mdletshe S. | The development of a free radiological anatomy software teaching tool [Desarrollo de un software libre de anatomia radiológica como una herramienta de enseñanza] | 2019 | The purpose of this research was to develop a free radiological anatomy software for radiologic anatomy education to assist students and professionals in health science. The study was divided into two phases: image acquisition and software development. The first phase was to obtain plain radiographic images and computed tomographic (CT) scans of an anthropomorphic phantom of head and neck. In addition, plain radiographic images of an anthropomorphic phantom of the chest were obtained. The second phase was the development of the anatomy software as an ImageJ macro. The software was developed through the insertion of the radiologic anatomy landmarks into the images that were obtained and application of multiple choice questions. The software was then tested for usability by getting the professors to answer the multiple choice questions. The software presented radiologic anatomy from 1) Head projections: Waters view, Towne view, Caldwell view, Lateral view, Submentovertex, PA view; 2) Thoracic Spine projections: AP and Lateral View and 3) Chest: PA view, Lateral and Oblique. Tomographic imaging presented one hundred radiologic landmarks of head. In total, there were 354 questions. A final report containing the score of correct answers, as well as the user ID, Date and Time of the test were showed. The test were available in three languages (Spanish, English and Portuguese). A user-friendly and inexpensive software was developed and presented. Students and professionals from several countries are able to practice, repeatedly, the recognition of radiologic anatomical landmarks. © 2019, Universidad de la Frontera. All rights reserved. |
| 25 | Wu N., Gong E., Wang B., Gu W., Ding N., Zhang Z., Chen M., Yan L.L., Oldenburg B., Xu L.-Q. | A smart and multifaceted mobile health system for delivering evidence-based secondary prevention of stroke in rural China: Design, development, and feasibility study | 2019 | Background: Mobile health (mHealth) technologies hold great promise in improving the delivery of high-quality health care services. Yet, there has been little research so far applying mHealth technologies in the context of delivering stroke care in resource-limited rural regions. Objective: This study aimed to introduce the design and development of an mHealth system targeting primary health care providers and to ascertain its feasibility in supporting the delivery of a System-Integrated techNology-Enabled Model of cAre (SINEMA) service for strengthening secondary prevention of stroke in rural China. Methods: The SINEMA mHealth system was designed by a multidisciplinary team comprising public health researchers, neurologists, and information and communication technology experts. The iterative co-design and development of the mHealth system involved the following 5 steps: (1) assessing the needs of relevant end users through in-depth interviews of stakeholders, (2) designing the functional modules and evidence-based care content, (3) designing and building the system and user interface, (4) improving and enhancing the system through a 3-month pilot test in 4 villages, and (5) finalizing the system and deploying it in field trial, and finally, evaluating its feasibility through a survey of the dominant user group. Results: From the in-depth interviews of 49 relevant stakeholders, we found that village doctors had limited capacity in caring for village-dwelling stroke patients in rural areas. Primary health care workers demonstrated real needs in receiving appropriate training and support from the mHealth system as well as great interests in using the mHealth technologies and tools. Using these findings, we designed a multifaceted mHealth system with 7 functional modules by following the iterative user-centered design and software development approach. The mHealth system, aimed at 3 different types of users (village doctors, town physicians, and county managers), was developed and utilized in a cluster-randomized controlled trial by 25 village doctors in a resource-limited county in rural China to manage 637 stroke patients between July 2017 and July 2018. In the end, a survey on the usability and functions of the mHealth system among village doctors (the dominant group of users, response rate=96%, 24/25) revealed that most of them were satisfied with the essential functions provided (71%) and were keen to continue using it (92%) after the study. Conclusions: The mHealth system was feasible for assisting primary health care providers in rural China in delivering the SINEMA service on the secondary prevention of stroke. Further research and initiatives in scaling up the SINEMA approach and this mHealth system to other resource-limited regions in China and beyond will likely enhance the quality and accessibility of essential secondary prevention among stroke patients. © Na Wu, Enying Gong, Bo Wang, Wanbing Gu, Nan Ding, Zhuoran Zhang, Mengyao Chen, Lijing L Yan, Brian Oldenburg, Li-Qun Xu. |
| 26 | Wu N., Gong E., Wang B., Gu W., Ding N., Zhang Z., Chen M., Yan L.L., Oldenburg B., Xu L.-Q. | A smart and multifaceted mobile health system for delivering evidence-based secondary prevention of stroke in rural China: Design, development, and feasibility study | 2019 | Background: Mobile health (mHealth) technologies hold great promise in improving the delivery of high-quality health care services. Yet, there has been little research so far applying mHealth technologies in the context of delivering stroke care in resource-limited rural regions. Objective: This study aimed to introduce the design and development of an mHealth system targeting primary health care providers and to ascertain its feasibility in supporting the delivery of a System-Integrated techNology-Enabled Model of cAre (SINEMA) service for strengthening secondary prevention of stroke in rural China. Methods: The SINEMA mHealth system was designed by a multidisciplinary team comprising public health researchers, neurologists, and information and communication technology experts. The iterative co-design and development of the mHealth system involved the following 5 steps: (1) assessing the needs of relevant end users through in-depth interviews of stakeholders, (2) designing the functional modules and evidence-based care content, (3) designing and building the system and user interface, (4) improving and enhancing the system through a 3-month pilot test in 4 villages, and (5) finalizing the system and deploying it in field trial, and finally, evaluating its feasibility through a survey of the dominant user group. Results: From the in-depth interviews of 49 relevant stakeholders, we found that village doctors had limited capacity in caring for village-dwelling stroke patients in rural areas. Primary health care workers demonstrated real needs in receiving appropriate training and support from the mHealth system as well as great interests in using the mHealth technologies and tools. Using these findings, we designed a multifaceted mHealth system with 7 functional modules by following the iterative user-centered design and software development approach. The mHealth system, aimed at 3 different types of users (village doctors, town physicians, and county managers), was developed and utilized in a cluster-randomized controlled trial by 25 village doctors in a resource-limited county in rural China to manage 637 stroke patients between July 2017 and July 2018. In the end, a survey on the usability and functions of the mHealth system among village doctors (the dominant group of users, response rate=96%, 24/25) revealed that most of them were satisfied with the essential functions provided (71%) and were keen to continue using it (92%) after the study. Conclusions: The mHealth system was feasible for assisting primary health care providers in rural China in delivering the SINEMA service on the secondary prevention of stroke. Further research and initiatives in scaling up the SINEMA approach and this mHealth system to other resource-limited regions in China and beyond will likely enhance the quality and accessibility of essential secondary prevention among stroke patients. © 2019 Geoff McCombe, Aine Harrold, Katherine Brown, Liam Hennessy, Mary Clarke, David Hanlon, Sinead O'Brien, John Lyne, Ciaran Corcoran, Patrick McGorry, Walter Cullen. |
| 27 | De Bernardi S.M. | Application of principles, processes and technologies to design and develop the SkyFlight risk assessment | 2019 | The success of the flight mission is closely related to a wide set of factors that must be taken into consideration. Combining all these elements together, the risk associated to the flight can raise significantly, eventually resulting in a situation in which the flight should be cancelled, unless some mitigation of the risk factors are applied. The aim is the understanding of the expectable human abilities and limitations, in correlation with the aircraft status and all the external elements related to the flight. Following the guidance contained in Ref.1, this knowledge has being applied in the definition of a standardize approach for the design of the risk assessment procedures and software requirements. For the safety of the flight, it is essential that the pilot is able to discern in advance between a low and a high risk flight. With a Flight Risk Analysis Tool (FRAT) the pilot can proactively identify the hazard with a visual representation of the risk, applying an evaluation process and risk mitigation strategies, as described in Ref. 2. Moreover to better support this analysis the tool shall be enough complex to consider all aspects, but at the same time, easy to use and simply accessible (i.e. usable by an application installed on the portable device). SkyFlight has been developed to support the flight planning activities for the rotorcraft mission, being the optimal off-aircraft mean to carry out the evaluation of the flight, ensuring a thorough Safety Assessment. Pilots have SkyFlight application installed on their portable devices to access the service. As presented in Ref.3, SkyFlight gives to the Pilot a deep understanding of the current situation and the involved dynamics, to anticipate changes and future developments, and to clearly understand the consequences related to the flight. The features are designed to positively increase the Pilot Situational Awareness and reduce mission risks. The Safety is spread within all functionalities, starting from simple and common concepts, to a finer level with a deep performance calculations and what-if analysis. To further increase the safety, the latest developed functionality is the Flight Risk Assessment, which has been developed following the EASA and FAA standards, discussed in Ref. 4 and 5, and embedding the EHEST pre-departure Risk Assessment Checklist, provided in Ref. 5. The predefined set of checklist is available to support different types of flight (Training, HEMS, passenger, etc.) and each list is based on the PAVE (Pilot, Aircraft, Environment, External pressure) areas. In addition to the pre-departure Checklists, also In-flight and Post-flight Checklists have been shaped, following the approach discussed in Ref. 6. Through SkyFlight the pilot is able to fill the Risk Assessment Checklist, inserting mitigations where applicable and view the total score. The filled checklist can be saved and shared. It is also possible to export them in a pdf format and to send automatically via email to one or more email addresses. In addition to this, which reflects the state of the art for FRAT, some other peculiar features have been designed. Indeed, to better support the different rotorcraft missions and to meet the process of each operator, the Risk Assessment Checklists will be completely customized by the company safety manager. The functionalities have then being further enhanced with software developments to add value to the tool with both small and big features. For example, the order of the multiple choice answers changes every time the pilot access to the checklist, to guide her/him to read carefully the answers before the selection. More complex functionalities have been inserted to connect the flight planned with SkyFlight to the hazard evaluation, showing the weather data and all the notifications associated to the flight (NOTAMs, Warning/restrictive Airspaces infringements …). AW SkyFlight application can be installed on personal portable devices and the Flight Risk Assessment functionality can be used for free, to let every pilot from the general aviation to access to the safety enhancements above described. The FRAT capabilities, usability and utility have been then tested with the Leonardo Helicopters Division pilots as well as a set of specific customers pilots as representatives of the different types of operations (in the Executive and Private transport, Medical and Rescue services, Offshore operations, Security services and Utility). Copyright © 2019 by the Vertical Flight Society. All rights reserved. |
| 28 | Bowen J., Reeves S. | Engineering interactive systems with model-driven code contracts | 2018 | The use of sound and robust software engineering techniques are essential during the design and development of safety-critical interactive systems. Failure of such systems (such as those found in medical settings or transportation) can lead to serious harm or even fatalities. Model-based development of interactive systems provides a number of benefits which can support correctness of the interface, the interaction and the functional logic of the system. Many different approaches have been proposed which target the models at different aspects of the development process (for example task analysis, interface layouts, functional behaviours etc.) and which can be used in different ways (verification of correctness, usability, testing). Typically these rely on multiple models at differing levels of abstraction. There are challenges in ensuring consistency between the models, and more importantly in ensuring that the final implementation correctly satisfies all of the models. In this paper we propose a method of deriving pre-and post-conditions for both interactive and functional elements of the system from formal models. These are used to generate code contracts within a code framework to support programmers who are implementing the system described in such models. We describe both the process for this and present an initial examination of the applicability of the approach based on a proof-of-concept user study. This small study was intended to examine whether we could correctly derive the code contracts in an automated fashion and whether or not they were usable (and beneficial) for programmers working on a pre-defined task. This initial investigation suggested that such an approach can aid programmers in correctly implementing a specification and that the general approach outlined in the paper is worth developing further. © 2018 IEEE. |
| 29 | Thomsen E.K., Hemingway C., South A., Duda K.A., Dormann C., Farmer R., Coleman M., Coleman M. | ResistanceSim: Development and acceptability study of a serious game to improve understanding of insecticide resistance management in vector control programmes | 2018 | The use of insecticides is the cornerstone of effective malaria vector control. However, the last two decades has seen the ubiquitous use of insecticides, predominantly pyrethroids, causing widespread insecticide resistance and compromising the effectiveness of vector control. Considerable efforts to develop new active ingredients and interventions are underway. However, it is essential to deploy strategies to mitigate the impact of insecticide resistance now, both to maintain the efficacy of currently available tools as well as to ensure the sustainability of new tools as they come to market. Although the World Health Organization disseminated best practice guidelines for insecticide resistance management (IRM), Rollback Malaria's Vector Control Working Group identified the lack of practical knowledge of IRM as the primary gap in the translation of evidence into policy. ResistanceSim is a capacity strengthening tool designed to address this gap. The development process involved frequent stakeholder consultation, including two separate workshops. These workshops defined the learning objectives, target audience, and the role of mathematical models in the game. Software development phases were interspersed with frequent user testing, resulting in an iterative design process. User feedback was evaluated via questionnaires with Likert-scale and open-ended questions. The game was regularly evaluated by subject-area experts through meetings of an external advisory panel. Through these processes, a series of learning domains were identified and a set of specific learning objectives for each domain were defined to be communicated to vector control programme personnel. A simple "game model" was proposed that produces realistic outputs based on player strategy and also runs in real-time. Early testing sessions revealed numerous usability issues that prevented adequate player engagement. After extensive revisions, later testing sessions indicated that the tool would be a valuable addition to IRM training. © 2018 The Author(s). |
| 30 | García M.A.M., Rosales M.S.F., Domínguez E.L., Velázquez Y.H., Isidro S.D. | Telemonitoring system for patients with chronic kidney disease undergoing peritoneal dialysis: Usability assessment based on a case study | 2018 | There are two million people with chronic kidney disease (CKD) worldwide. In Mexico, it is estimated that by 2025, there will be 212 thousand CKD cases. Among the renal replacement treatments, peritoneal dialysis (PD) exists either in the continuous ambulatory (CAPD) or automated (APD) mode, which requires continuous monitoring and strict control. Thus, several software systems have been proposed to perform reliable remote monitoring of patients using PD but also to achieve the goal with effectiveness, efficiency and satisfaction; i.e., in software engineering, this is called usability. However, few studies have addressed usability issues using case studies with patients and medical staff in real domains. In this paper, we present a usability assessment of a telemonitoring system for patients with CKD on peritoneal dialysis treatment through a case study with patients and medical staff of the Mexican Institute of Social Security (IMSS). The usability evaluation was carried out through the application of two satisfaction instruments. These instruments evaluated multiple usability criteria, such as navigability, interactivity, motivation, satisfaction, and applicability. The results obtained from the usability evaluation show that, on average, the services offered by the system have 91.3% acceptance by users (patient-doctors), with the APD and CAPD exchange data registration services having the highest acceptance for patients, with a positive perception of 94.5% and 92.3%, respectively. Meanwhile, for the doctors and nurses, the alarm reception for patients in a risk situation was highest with 95% acceptance. Based on the obtained results, the evaluated telemonitoring system holds wide acceptance, satisfaction, and applicability from patients' and doctors' perspectives. It is also noted that the evaluated system considers and satisfies the requirements and suitable parameters that should be monitored in PD treatment according to studies presented in the literature. © 2018 Martínez García et al. This is an open access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited. |
| 31 | Ahmad M.A., Ahmed S. | Piezologist: A Novel Wearable Piezoelectric-based Cardiorespiratory Monitoring System | 2018 | In this paper, the design, prototyping and software development of a novel wearable cardiorespiratory parameters monitoring sensor and software applications is illustrated. Piezologist is an unobtrusive chest worn device. It comprises a patch-type sensor and a mobile application. The sensor utilizes piezoelectric material as the cardiorespiratory signal sensing component and MetaWearC board as the signal acquisition unit. The board also comes with Bluetooth Low Energy (BLE) support which is utilized for the raw signal transmission. The novelty aspect of the system rests on the fact that not only using a single cheap piezoelectric sheet common cardiorespiratory parameters (such as heart rate, respiration rate, and cycles) were obtained similar to previous studies but ECG waveform and blood pressure data were also extracted successfully using the same sensor. In addition, sensor packaging design and prototyping and their effect on the acquired signal strength on one hand and the package size (volume and weight) on the other hand were studied and reported. For performance validation purpose, the developed cardiorespiratory monitoring sensor system results were validated against two commercial sensor devices namely 3-lead ECG sensor from eHealth sensor kit and Zephyr belt-type BioHarness sensor, and the results were reported herein. The validation process outcomes confirmed that the cardiorespiratory signals extracted using Piezologist conform with a heartbeat, respiratory cycle and ECG waveform obtained using the commercial sensors. Furthermore, a usability study was conducted to compare the user experience offered by Piezologist against commercially available sensors for measuring cardiorespiratory parameters. The study highlighted the potential that Piezologist will take over the commercial available belt-type, watch-type and 3-lead ECG sensors. © 2018 IEEE. |
| 32 | Børøsund E., Mirkovic J., Clark M.M., Ehlers S.L., Andrykowski M.A., Bergland A., Westeng M., Nes L.S. | A stress management app intervention for cancer survivors: Design, development, and usability testing | 2018 | Background: Distress is prevalent in cancer survivors. Stress management interventions can reduce distress and improve quality of life for cancer patients, but many people with cancer are unfortunately not offered or able to attend such in-person stress management interventions. Objective: The objective of this study was to develop an evidence-based stress management intervention for patients living with cancer that can be delivered electronically with wide reach and dissemination. This paper describes the design and development process of a technology-based stress management intervention for cancer survivors, including the exploration phase, intervention content development, iterative software development (including design, development, and formative evaluation of low- and high-level prototypes), and security and privacy considerations. Methods: Design and development processes were iterative and performed in close collaboration with key stakeholders (N=48). In the exploration phase, identifying needs and requirements for the intervention, 28 participants gave input, including male and female cancer survivors (n=11) representing a wide age range (31-81 years) and cancer diagnoses, healthcare providers (n=8) including psychosocial oncology experts, and eHealth experts (n=9) including information technology design and developers. To ensure user involvement in each phase various user-centered design and service design methods were included, such as interviews, usability testing, and think aloud processes. Overall, participants were involved usability testing in the software development and formative evaluation phase, including cancer survivors (n=6), healthy volunteers (n=7), health care providers (n=2), and eHealth experts (n=5). Intervention content was developed by stress management experts based on well-known cognitive behavioral stress management strategies and adjusted to electronic format through multiple iterations with stakeholders. Privacy and security issues were considered throughout. Results: The design and development process identified a variety of stakeholder requirements. Cancer survivors preferred stress management through a mobile app rather than through a personal computer (PC) and identified usefulness, easy access, user friendliness, use of easily understandable language, and many brief sections rather than longer ones as important components of the intervention. These requirements were also supported by recommendations from health care providers and eHealth experts. The final intervention was named StressProffen and the hospital Privacy and Security Protection Committee was part of the final intervention approval to also ensure anchoring in the hospital organization. Conclusions: Interventions, even evidence-based, have little impact if not actively used. This study illustrates how user-centered design and service design can be applied to identify and incorporate essential stakeholder aspects in the entire design and development process. In combination with evidence-based concepts, this process facilitated development of a stress management intervention truly designed for the end users, in this case, cancer survivors. © Elin Børøsund, Jelena Mirkovic, Matthew M Clark, Shawna L Ehlers, Michael A Andrykowski, Anne Bergland, Marianne Westeng, Lise Solberg Nes. Originally published in JMIR Formative Research (http://formative.jmir.org), 06.09.2018. This is an open-access article distributed under the terms of the Creative Commons Attribution License. |
| 33 | Leightley D., Puddephatt J.-A., Jones N., Mahmoodi T., Chui Z., Field M., Drummond C., Rona R.J., Fear N.T., Goodwin L. | A smartphone app and personalized text messaging framework (InDex) to monitor and reduce alcohol use in ex-serving personnel: Development and feasibility study | 2018 | Background: Self-reported alcohol misuse remains high in armed forces personnel even after they have left service. More than 50% of ex-serving personnel meet the criteria for hazardous alcohol use; however, many fail to acknowledge that they have a problem. Previous research indicates that interventions delivered via smartphone apps are suitable in promoting self-monitoring of alcohol use, have a broad reach, and may be more cost-effective than other types of brief interventions. There is currently no such intervention specifically designed for the armed forces.Objective: This study sought to describe the development of a tailored smartphone app and personalized text messaging (short message service, SMS) framework and to test the usability and feasibility (measured and reported as user engagement) of this app in a hard-to-engage ex-serving population.Methods: App development used Agile methodology (an incremental, iterative approach used in software development) and was informed by behavior change theory, participant feedback, and focus groups. Participants were recruited between May 2017 and June 2017 from an existing United Kingdom longitudinal military health and well-being cohort study, prescreened for eligibility, and directed to download either Android or iOS versions of the ”Information about Drinking for Ex-serving personnel” (InDEx) app. Through the app, participants were asked to record alcohol consumption, complete a range of self-report measures, and set goals using implementation intentions (if-then plans). Alongside the app, participants received daily automated personalized text messages (SMS) corresponding to specific behavior change techniques with content informed by the health action process approach with the intended purpose of promoting the use of the drinks diary, suggesting alternative behaviors, and providing feedback on goals setting. Results: Invitations to take part in the study were sent to ex-serving personnel, 22.6% (31/137) of whom accepted and downloaded the app. Participants opened the InDEx app a median of 15.0 (interquartile range [IQR] 8.5-19.0) times during the 4 week period (28 days), received an average of 36.1 (SD 3.2) text messages (SMS), consumed alcohol on a median of 13.0 (IQR 11.0-15.0) days, and consumed a median of 5.6 (IQR 3.3-11.8) units per drinking day in the first week, which decreased to 4.7 (IQR 2.0-6.9) units by the last week and remained active for 4.0 (IQR 3.0-4.0) weeks. Conclusions: Personnel engaged and used the app regularly as demonstrated by the number of initializations, interactions, and time spent using InDEx. Future research is needed to evaluate the engagement with and efficacy of InDEx for the reduction of alcohol consumption and binge drinking in an armed forces population. © Daniel Leightley, Jo-Anne Puddephatt, Norman Jones, Toktam Mahmoodi, Zoe Chui, Matt Field, Colin Drummond, Roberto J Rona, Nicola T Fear, Laura Goodwin. |
| 34 | Leightley D., Puddephatt J.-A., Jones N., Mahmoodi T., Chui Z., Field M., Drummond C., Rona R.J., Fear N.T., Goodwin L. | A smartphone app and personalized text messaging framework (InDEx) to monitor and reduce alcohol use in ex-serving personnel: Development and feasibility study | 2018 | Background: Self-reported alcohol misuse remains high in armed forces personnel even after they have left service. More than 50% of ex-serving personnel meet the criteria for hazardous alcohol use; however, many fail to acknowledge that they have a problem. Previous research indicates that interventions delivered via smartphone apps are suitable in promoting self-monitoring of alcohol use, have a broad reach, and may be more cost-effective than other types of brief interventions. There is currently no such intervention specifically designed for the armed forces. Objective: This study sought to describe the development of a tailored smartphone app and personalized text messaging (short message service, SMS) framework and to test the usability and feasibility (measured and reported as user engagement) of this app in a hard-to-engage ex-serving population. Methods: App development used Agile methodology (an incremental, iterative approach used in software development) and was informed by behavior change theory, participant feedback, and focus groups. Participants were recruited between May 2017 and June 2017 from an existing United Kingdom longitudinal military health and well-being cohort study, prescreened for eligibility, and directed to download either Android or iOS versions of the”Information about Drinking for Ex-serving personnel” (InDEx) app. Through the app, participants were asked to record alcohol consumption, complete a range of self-report measures, and set goals using implementation intentions (if-then plans). Alongside the app, participants received daily automated personalized text messages (SMS) corresponding to specific behavior change techniques with content informed by the health action process approach with the intended purpose of promoting the use of the drinks diary, suggesting alternative behaviors, and providing feedback on goals setting. Results: Invitations to take part in the study were sent to ex-serving personnel, 22.6% (31/137) of whom accepted and downloaded the app. Participants opened the InDEx app a median of 15.0 (interquartile range [IQR] 8.5-19.0) times during the 4 week period (28 days), received an average of 36.1 (SD 3.2) text messages (SMS), consumed alcohol on a median of 13.0 (IQR 11.0-15.0) days, and consumed a median of 5.6 (IQR 3.3-11.8) units per drinking day in the first week, which decreased to 4.7 (IQR 2.0-6.9) units by the last week and remained active for 4.0 (IQR 3.0-4.0) weeks. Conclusions: Personnel engaged and used the app regularly as demonstrated by the number of initializations, interactions, and time spent using InDEx. Future research is needed to evaluate the engagement with and efficacy of InDEx for the reduction of alcohol consumption and binge drinking in an armed forces population. © Daniel Leightley, Jo-Anne Puddephatt, Norman Jones, Toktam Mahmoodi, Zoe Chui, Matt Field, Colin Drummond, Roberto J Rona, Nicola T Fear, Laura Goodwin. Originally published in JMIR Mhealth and Uhealth (http://mhealth.jmir.org), 11.09.2018. This is an open-access article distributed under the terms of the Creative Commons Attribution License. |
| 35 | Özcan-Top Ö., McCaffery F. | A hybrid assessment approach for medical device software development companies | 2018 | Medical device software development organizations are bound by regulatory requirements and constraints to ensure that developed medical devices will not harm patients. Medical devices have to be treated as complete systems and be evaluated in this manner. Instead of manufacturers having to ensure compliance to various regulatory standards individually, the authors previously developed a medical device software process assessment framework called MDevSPICE® that integrates the regulatory requirements from all the relevant medical device software standards. The MDevSPICE® was developed in a manner that suits plan-driven software development. To improve the usability of MDevSPICE® in agile settings, we extended the assessment approach. The hybrid assessment approach described here combines the MDevSPICE®-based process assessment method with steps for prioritization of improvement needs through value stream mapping and enabling process improvement through the use of KATA technique. This approach integrates agile methods into the medical device software development process while adhering to the requirements of the regulatory standards. This paper describes the implementation of the approach within 4 organizations that develop software in line with medical device regulations. Copyright © 2017 John Wiley & Sons, Ltd. |
| 36 | Rezaei-hachesu P., Samad-Soltani T., Yaghoubi S., GhaziSaeedi M., Mirnia K., Masoumi-Asl H., Safdari R. | The design and evaluation of an antimicrobial resistance surveillance system for neonatal intensive care units in Iran | 2018 | Introduction: Neonatal intensive care units (NICUs) have complex patients in terms of their diagnoses and required treatments. Antimicrobial treatment is a common therapy for patients in NICUs. To solve problems pertaining to empirical therapy, antimicrobial stewardship programs have recently been introduced. Despite the success of these programs in terms of data collection, there is still inefficiency in terms of analyzing and reporting the data. Thus, to successfully implement these stewardship programs, the design of antimicrobial resistance (AMR) surveillance systems is recommended as a first step. As a result, this study aimed to design an AMR surveillance system for use in the NICUs in northwestern Iranian hospitals to cover these information gaps. Methods: The recommended system is compatible with the World Health Organization (WHO) guidelines. The business intelligence (BI) requirements were extracted in an interview with a product owner (PO) using a valid and reliable checklist. Following this, an AMR surveillance system was designed and evaluated in relation to user experiences via a user experience questionnaire (UEQ). Finally, an association analysis was performed on the database, and the results were reported by identifying the important multidrug resistances in the database. Results: A customized software development methodology was proposed. The three major modules of the AMR surveillance are the data registry, dashboard, and decision support modules. The data registry module was implemented based on a three-tier architecture, and the Clinical Decision Support System (CDSS) and dashboard modules were designed based on the BI requirements of the Scrum product owner (PO). The mean values of UEQ measures were in a good range. This measures showed the suitable usability of the AMR surveillance system. Conclusion: Applying efficient software development methodologies allows for the systems’ compatibility with users’ opinions and requirements. In addition, the construction of interdisciplinary communication models for research and software engineering allows for research and development concepts to be used in operational environments. © 2018 Elsevier B.V. |
| 37 | Crepaldi N.Y., de Lima I.B., Vicentine F.B., Rodrigues L.M.L., Sanches T.L.M., Ruffino-Netto A., Alves D., Rijo R.P.C.L. | Towards a Clinical Trial Protocol to Evaluate Health Information Systems: Evaluation of a Computerized System for Monitoring Tuberculosis from a Patient Perspective in Brazil | 2018 | Assessment of health information systems consider different aspects of the system itself. They focus or on the professional who will use the software or on its usability or on the software engineering metrics or on financial and managerial issues. The existent approaches are very resources consuming, disconnected, and not standardized. As the software becomes more critical in the health organizations and in patients, becoming used as a medical device or a medicine, there is an urgency to identify tools and methods that can be applied in the development process. The present work is one of the steps of a broader study to identify standardized protocols to evaluate the health information systems as medicines and medical devices are evaluated by clinical trials. The goal of the present work was to evaluate the effect of the introduction of an information system for monitoring tuberculosis treatment (SISTB) in a Brazilian municipality from the patients’ perspective. The Patient Satisfaction Questionnaire and the Hospital Consumer Assessment of Healthcare Providers and Systems were answered by the patients before and after the SISTB introduction, for comparison. Patients from an outpatient clinic, formed the control group, that is, at this site was not implanted the SISTB. Descriptive statistics and mixed effects model were used for data analysis. Eighty-eight interviews were conducted in the study. The questionnaire’s results presented better averages after the system introduction but were not considered statistically significant. Therefore, it was not possible to associate system implantation with improved patient satisfaction. The HIS evaluation need be complete, the technical and managerial evaluation, the safety, the impact on the professionals and direct and/or indirect impact on patients are important. Developing the right tools and methods that can evaluate the software in its entirety, from the beginning of the development cycle with a normalized scale, are needed. © 2018, Springer Science+Business Media, LLC, part of Springer Nature. |
| 38 | Yang Y., Zu Q., Liu P., Ouyang D., Li X. | Microshare: Privacy-preserved medical resource sharing through microService architecture | 2018 | This paper takes up the problem of medical resource sharing through MicroService architecture without compromising patient privacy. To achieve this goal, we suggest refactoring the legacy EHR systems into autonomous MicroServices communicating by the unified techniques such as RESTFul web service. This lets us handle clinical data queries directly and far more efficiently for both internal and external queries. The novelty of the proposed approach lies in avoiding the data de-identification process often used as a means of preserving patient privacy. The implemented toolkit combines software engineering technologies such as Java EE, RESTful web services, JSON Web Tokens to allow exchanging medical data in an unidentifiable XML and JSON format as well as restricting users to the need-to-know principle. Our technique also inhibits retrospective processing of data such as attacks by an adversary on a medical dataset using advanced computational methods to reveal Protected Health Information (PHI). The approach is validated on an endoscopic reporting application based on openEHR and MST standards. From the usability perspective, the approach can be used to query datasets by clinical researchers, governmental or non-governmental organizations in monitoring health care and medical record services to improve quality of care and treatment. © Ivyspring International Publisher. |
| 39 | Wayan Pulantara I., Parmanto B., Germain A. | Development of a just-in-time adaptive mhealth intervention for insomnia: Usability study | 2018 | Background: Healthy sleep is a fundamental component of physical and brain health. Insomnia, however, is a prevalent sleep disorder that compromises functioning, productivity, and health. Therefore, developing efficient treatment delivery methods for insomnia can have significant societal and personal health impacts. Cognitive behavioral therapy for insomnia (CBTI) is the recommended first-line treatment of insomnia but access is currently limited for patients, since treatment must occur in specialty sleep clinics, which suffer from an insufficient number of trained clinicians. Smartphone-based interventions offer a promising means for improving the delivery of CBTI. Furthermore, novel features such as real-time monitoring and assessment, personalization, dynamic adaptations of the intervention, and context awareness can enhance treatment personalization and effectiveness, and reduce associated costs. Ultimately, this “Just in Time Adaptive Intervention” for insomnia-an intervention approach that is acceptable to patients and clinicians, and is based on mobile health (mHealth) platform and tools-can significantly improve patient access and clinician delivery of evidence-based insomnia treatments. Objective: This study aims to develop and assess the usability of a Just in Time Adaptive Intervention application platform called iREST (“interactive Resilience Enhancing Sleep Tactics”) for use in behavioral insomnia interventions. iREST can be used by both patients and clinicians. Methods: The development of iREST was based on the Iterative and Incremental Development software development model. Requirement analysis was based on the case study's description, workflow and needs, clinician inputs, and a previously conducted BBTI military study/implementation of the Just in Time Adaptive Intervention architecture. To evaluate the usability of the iREST mHealth tool, a pilot usability study was conducted. Additionally, this study explores the feasibility of using an off-the-shelf wearable device to supplement the subjective assessment of patient sleep patterns. Results: The iREST app was developed from the mobile logical architecture of Just in Time Adaptive Intervention. It consists of a cross-platform smartphone app, a clinician portal, and secure 2-way communications platform between the app and the portal. The usability study comprised 19 Active Duty Service Members and Veterans between the ages of 18 and 60. Descriptive statistics based on in-app questionnaires indicate that on average, 12 (mean 12.23, SD 8.96) unique devices accessed the clinician portal per day for more than two years, while the app was rated as “highly usable”, achieving a mean System Usability Score score of 85.74 (SD 12.37), which translates to an adjective rating of “Excellent”. The participants also gave high scores on “ease of use and learnability” with an average score of 4.33 (SD 0.65) on a scale of 1 to 5. Conclusions: iREST provides a feasible platform for the implementation of Just in Time Adaptive Intervention in mHealth-based and remote intervention settings. The system was rated highly usable and its cross-platformness made it readily implemented within the heavily segregated smartphone market. The use of wearables to track sleep is promising; yet the accuracy of this technology needs further improvement. Ultimately, iREST demonstrates that mHealth-based Just in Time Adaptive Intervention is not only feasible, but also works effectively. © I Wayan Pulantara, Bambang Parmanto, Anne Germain. |
| 40 | Li B., Li J., Lan X., An Y., Gao W., Jiang Y. | Experiences of building a medical data acquisition system based on two-level modeling | 2018 | Background and purpose: Compared to traditional software development strategies, the two-level modeling approach is more flexible and applicable to build an information system in the medical domain. However, the standards of two-level modeling such as openEHR appear complex to medical professionals. This study aims to investigate, implement, and improve the two-level modeling approach, and discusses the experience of building a unified data acquisition system for four affiliated university hospitals based on this approach. Method: After the investigation, we simplified the approach of archetype modeling and developed a medical data acquisition system where medical experts can define the metadata for their own specialties by using a visual easy-to-use tool. Result: The medical data acquisition system for multiple centers, clinical specialties, and diseases has been developed, and integrates the functions of metadata modeling, form design, and data acquisition. To date, 93,353 data items and 6,017 categories for 285 specific diseases have been created by medical experts, and over 25,000 patients’ information has been collected. Discussion and conclusion: OpenEHR is an advanced two-level modeling method for medical data, but its idea to separate domain knowledge and technical concern is not easy to realize. Moreover, it is difficult to reach an agreement on archetype definition. Therefore, we adopted simpler metadata modeling, and employed What-You-See-Is-What-You-Get (WYSIWYG) tools to further improve the usability of the system. Compared with the archetype definition, our approach lowers the difficulty. Nevertheless, to build such a system, every participant should have some knowledge in both medicine and information technology domains, as these interdisciplinary talents are necessary. © 2018 Elsevier B.V. |
| 41 | Cao H., Van de Perre G., Kennedy J., Senft E., Esteban P.G., De Beir A., Simut R., Belpaeme T., Lefeber D., Vanderborght B. | A personalized and platform-independent behavior control system for social robots in therapy: development and applications | 2018 | Social robots have been proven beneficial in different types of healthcare interventions. An ongoing trend is to develop (semi-)autonomous socially assistive robotic systems in healthcare context to improve the level of autonomy and reduce human workload. This paper presents a behavior control system for social robots in therapies with a focus on personalization and platform-independence. This system architecture provides the robot an ability to behave as a personable character, which behaviors are adapted to user profiles and responses during the human-robot interaction. Robot behaviors are designed at abstract levels and can be transferred to different social robot platforms. We adopt the component-based software engineering approach to implement our proposed architecture to allow for the replaceability and reusability of the developed components. We introduce three different experimental scenarios to validate the usability of our system. Results show that the system is potentially applicable to different therapies and social robots. With the component-based approach, the system can serve as a basic framework for researchers to customize and expand the system for their targeted healthcare applications. IEEE |
| 42 | Min Q., Liu N., Chen Y. | A web-based medical image viewer for 2D and 3D visualization | 2018 | With the development of Internet technology, telemedicine technology has become one of the hottest research topics. In this paper, a Web-based medical image viewer application is presented in order to facilitate timely and accurate diagnoses in a telemedicine system. The application can access the remote medical image database and display image over the network. This application implements the basic functions of the two-dimensional image processing. Besides, 3D functions, e.g, volume rendering and surface rendering of region of interest, fly through, can be also implemented by the proposed viewer. Medical staff can perform some basic operations via the mouse to make more effective diagnosis. Experimental results show that the basic image processing functions and advanced 3D functions can be achieved by this application and it presents a high level of usability, functionality and performance. © 2018 Association for Computing Machinery. |
| 43 | [No author name available] | CEUR Workshop Proceedings | 2018 | The proceedings contain 22 papers. The topics discussed include: on software complexity of agent-oriented logic programs: an empirical analysis; impact of code smells on the rate of defects in software: a literature review; lessons learned from developing prototypes for customer complaint validation; using games to understand and create randomness; usability and quality parameters for e-learning environments and systems; expanding on the process perspective in software process improvement practices; reducing combinatorial testing requirements based on equivalences with respect to the code under test; quantitative quality analysis of scientific software case study; utilize syntax tree transformations as a C/C++ test seam; using threshold derivation of software metrics for building classifiers in defect prediction; process quality monitoring and optimization: a case study for a smart city health domain; the overview on information system acceptance in Serbian primary care the case of regional center; a case-control study on the server-side bandages against XSS; evaluating fitness functions for automated code transformations; establishing software product lines from existing products based on feature model recovery and merging; and replication of quantitative analysis of fault distributions on open source complex software systems. |
| 44 | Farinango C.D., Benavides J.S., Cerón J.D., López D.M., Álvarez R.E. | Human-centered design of a personal health record system for metabolic syndrome management based on the ISO 9241-210:2010 standard | 2018 | Background: Previous studies have demonstrated the effectiveness of information and communication technologies to support healthy lifestyle interventions. In particular, personal health record systems (PHR-Ss) empower self-care, essential to support lifestyle changes. Approaches such as the user-centered design (UCD), which is already a standard within the software industry (ISO 9241-210:2010), provide specifications and guidelines to guarantee user acceptance and quality of eHealth systems. However, no single PHR-S for metabolic syndrome (MS) developed following the recommendations of the ISO 9241-210:2010 specification has been found in the literature. Objective: The aim of this study was to describe the development of a PHR-S for the management of MS according to the principles and recommendations of the ISO 9241-210 standard. Methods: The proposed PHR-S was developed using a formal software development process which, in addition to the traditional activities of any software process, included the principles and recommendations of the ISO 9241-210 standard. To gather user information, a survey sample of 1,187 individuals, eight interviews, and a focus group with seven people were performed. Throughout five iterations, three prototypes were built. Potential users of each system evaluated each prototype. The quality attributes of efficiency, effectiveness, and user satisfaction were assessed using metrics defined in the ISO/IEC 25022 standard. Results: The following results were obtained: 1) a technology profile from 1,187 individuals at risk for MS from the city of Popayan, Colombia, identifying that 75.2% of the people use the Internet and 51% had a smartphone; 2) a PHR-S to manage MS developed (the PHR-S has the following five main functionalities: record the five MS risk factors, share these measures with health care professionals, and three educational modules on nutrition, stress management, and a physical activity); and 3) usability tests on each prototype obtaining the following results: 100% effectiveness, 100% efficiency, and 84.2 points in the system usability scale. Conclusion: The software development methodology used was based on the ISO 9241-210 standard, which allowed the development team to maintain a focus on user’s needs and requirements throughout the project, which resulted in an increased satisfaction and acceptance of the system. Additionally, the establishment of a multidisciplinary team allowed the application of considerations not only from the disciplines of software engineering and health sciences but also from other disciplines such as graphical design and media communication. Finally, usability testing allowed the observation of flaws in the designs, which helped to improve the solution. © 2018 Farinango et al. |
| 45 | Green R., Brandt R., Miller A. | A framework for integrating safety in usability engineering for electronic health records | 2018 | Usability engineering approaches, borrowed from commercial software development, rarely hold safety as a significant design priority. This paper presents our approach for integrating safety into EHR usability testing and reporting. We present five insights gained in our attempts to better integrate safety into EHR usability testing and we present the Usability FMEA as a framework for more effectively integrating safety into usability testing. Takeaways from this presentation include 1): Usability testing has evolved out of non-safety critical environments; 2) Safety must be designed into test scenarios and scripts, and tested for explicitly; 3) The Usability FMEA with the SEIPS model can help to identify factors that may be affected by the implementation of a new technology; 4) Usability testing and evaluations should be extended into the post-implementation phase in client sites. © 2018 Human Factors an Ergonomics Society Inc.. All rights reserved. |
| 46 | Aljaber T., Gordon N. | A hybrid evaluation approach and guidance for mHealth education applications | 2018 | Mobile health education applications (MHEAs) are used to support different users. However, although these applications are increasing in number, there is no effective evaluation framework to measure their usability and thus save effort and time for their many user groups. This paper outlines a useful framework for evaluating MHEAs, together with particular evaluation metrics: an efficient hybrid of selected heuristic evaluation (HE) and usability evaluation (UE) factors to enable the determination of the usefulness and usability of MHEAs. We also propose a guidance tool to help stakeholders choose the most suitable MHEA. The outcome of this framework is envisioned as meeting the requirements of different users, in addition to enhancing the development of MHEAs using software engineering approaches by creating new and more effective evaluation techniques. Finally, we present qualitative and quantitative results for the framework when used with MHEAs. © Springer International Publishing AG 2018. |
| 47 | Scherer D., Gouveia Filho F.F. | Documentation template for the usability engineering process for medical devices | 2018 | Introduction: Medical device regulatory processes are currently based on technical (ISO IEC 62366:2015) and regulatory standards (IEC ISO 60601-1-6:2015), which provide an international standard to be applied in evaluating devices and their documentation. However, the lack of standardization in the usability engineering processes used by the manufacturers, and the absence of pre-established metrics for such processes are constant problems in the medical device universe, particularly hindering the evaluation processes. It was verified that the current norms are insufficient to guarantee good usability engineering processes, even with the existence of good usability practices in the literature. Objective: This paper presents an analysis of the requirements contained in current standards and proposes a documentation model for usability engineering of medical devices, from the presentation of some techniques that are used in the process of device development. Method: This work is based on literature reviews to identify the state of the art in usability engineering; analysis of current standards, to verify what the regulatory requirements are, and how to comply with them; comparative studies with existing documentation to identify strengths and weaknesses in documentation processes; and elaboration of documentation prototypes. Results: From these results, it was possible to prepare a template document with all the points required by the current norms. Appropriate techniques were also listed for the accomplishment of some stages of the process, creating greater rigidity in the definition of the parameters of the documentation. © Springer Nature Singapore Pte Ltd. 2019. |
| 48 | De Medeiros Matos J., Rendeiro M.M.P. | HemoApp: Applicative to support the care of patients with hereditary coagulopathies | 2018 | The increase in the use of mobile devices has also affected the health area, taking advantage of this context is increasing the number of applicatives specially developed to make the health professionals’ daily routine easier with the patient. Targeting to provide care support to the patient with hereditary coagulopathy, this paper aims to present the applicative developed during the Masters Degree course in e-health and e-medicine from UERJ. The applicative is able to provide, besides the support with scientific evidence for evaluation and classification of the patient, the qualification of the professionals in health care, which will allow the assistance of these patients in the primary care with quality and safety, avoiding unnecessary displacements by the patient and the overcrowding of the blood centers. The application was developed in 2 phases: elaboration of the prototype and pre-test. The software engineering methodology chosen for the elaboration of the applicative was Agile Methodologies. The applicative was developed for Android platform, using the JAVAScript language with Reactive-Native framework. The application was divided into 2 modules: Hemophilia module and Von Willebrand module. The application was named "Hemoapp" and 44 screens were created. In the pre-test the ergonomic and usability criteria were evaluated, obtaining a positive result from the evaluators, showing that it is feasible to use this tool in the permanent education and support to the management of the patient with hereditary coagulopathies. © 2018 IADIS Press. All Rights Reserved. |
| 49 | Vilardaga R., Rizo J., Zeng E., Kientz J.A., Ries R., Otis C., Hernandez K. | User-centered design of learn to quit, a smoking cessation smartphone app for people with serious mental illness | 2018 | Background: Smoking rates in the United States have been reduced in the past decades to 15% of the general population. However, up to 88% of people with psychiatric symptoms still smoke, leading to high rates of disease and mortality. Therefore, there is a great need to develop smoking cessation interventions that have adequate levels of usability and can reach this population. Objective: The objective of this study was to report the rationale, ideation, design, user research, and final specifications of a novel smoking cessation app for people with serious mental illness (SMI) that will be tested in a feasibility trial. Methods: We used a variety of user-centered design methods and materials to develop the tailored smoking cessation app. This included expert panel guidance, a set of design principles and theory-based smoking cessation content, development of personas and paper prototyping, usability testing of the app prototype, establishment of app's core vision and design specification, and collaboration with a software development company. Results: We developed Learn to Quit, a smoking cessation app designed and tailored to individuals with SMI that incorporates the following: (1) evidence-based smoking cessation content from Acceptance and Commitment Therapy and US Clinical Practice Guidelines for smoking cessation aimed at providing skills for quitting while addressing mental health symptoms, (2) a set of behavioral principles to increase retention and comprehension of smoking cessation content, (3) a gamification component to encourage and sustain app engagement during a 14-day period, (4) an app structure and layout designed to minimize usability errors in people with SMI, and (5) a set of stories and visuals that communicate smoking cessation concepts and skills in simple terms. Conclusions: Despite its increasing importance, the design and development of mHealth technology is typically underreported, hampering scientific innovation. This report describes the systematic development of the first smoking cessation app tailored to people with SMI, a population with very high rates of nicotine addiction, and offers new design strategies to engage this population. mHealth developers in smoking cessation and related fields could benefit from a design strategy that capitalizes on the role visual engagement, storytelling, and the systematic application of behavior analytic principles to deliver evidence-based content. |
| 50 | Tamargo R.S., Ngipol D.P., Palaoag T.D. | Multidimensional application grade of interconnected and locally administered services (MAGILAS): A management information system of Ifugao State University | 2017 | Integrated system is currently embraced by most organizations which supports efficiency, effectiveness and reduces cost. It significantly promotes transparency, process reliability and reduces the proneness to errors. It also magnifies basic information by uniting functional or technical elements of one information system in an organized approach. Various organizations including universities encountered difficulties in managing a continually expanding volume of data concerning employees, students or its clienteles. This system provides an avenue for off-campus and distant offices to all educational resources and significant information connected through wireless network allowing to store necessary data in a reliable storage or information system for easier access to relevant data. The Multidimensional Application Grade of Interconnected and Locally Administered Services (MAGILAS) helps in interconnecting different offices for the delivery of necessary services to nominated stakeholders. It covers services of the following Service Departments and Offices: Registrar Services; Finance Services; Student Services and Development; Library Services; Research Development and Extension Training Services; Health Services; and Office of the Deans. Generally, the developed system met the objective of the university to produce and disseminate innovations and technologies in promoting sustainable development and streamlining its services. Essential data were gather by means of survey questionnaires given to the head of service units and selected students of the different colleges and department of the campus. The majority of the respondents were strongly agreed on usability level based from the result of System Usability Scale survey due to its respectable rating interpreted as “Excellent”. The outcomes of the management information system were increased in data availability, productivity and reliability. Hence, MAGILAS shows the dynamically inspired integrated software development. © 2017 Association for Computing Machinery. |
| 51 | Mohsen W., Aref M., ElBahnasy K. | Software metrics for cooperative scrum based ontology analysis | 2017 | One can only control what he can measure. Measuring ontologies in general and inter-organizational ontologies in special is necessary to evaluate ontologies during cooperative development and evolution processes. A software metric is a standard of measuring the degree to which a software system and process possess some property. Metrics help to estimate the progress, quality, and health of a software and its development process. The availability of robust metrics in the early phases of the software development allows the better management of the later steps and a more efficient quality assessment when preventive or corrective actions can easily enhance quality. In this paper, we propose a set of cooperative Scrum based software metrics and architectural metrics that can be applied to cooperative ontology development and evolution process using Scrum framework. These metrics help improve cooperative teams' performance and improve the quality of development and evolution process of inter-organizational ontologies. Furthermore, most of these metrics can be applied easily to any daily ontology activities to ensure ontology reliability, maintainability, and usability. © 2017 IEEE. |
| 52 | Schmidt J.D.E., De Marchi A.C.B. | Usability evaluation methods for mobile serious games applied to health: a systematic review | 2017 | This paper aims to present the results of a systematic review focused on usability evaluation methods for serious games (SG) of mobile devices applicable to health care. The research questioned which usability evaluation methods have been available for mobile serious games. The research was conducted into four databases (ACM, IEEE, Science Direct and Springer) in two periods (23–30 March, 2015, and 01–07 June, 2016). After evaluating 2191 papers, the researchers considered that 9 met the eligibility criteria. As a result, similarities between some methodologies used have been found, however a specific methodology for SGs usability evaluation applicable to health has not been encountered. © 2016, Springer-Verlag Berlin Heidelberg. |
| 53 | Lian X., Cleland-Huang J., Zhang L. | Mining Associations between Quality Concerns and Functional Requirements | 2017 | The cost and effort of developing software systems in a new technical area can be extensive. An organization must perform a domain analysis to discover competing products, analyze their architectures and features, and ultimately discover and specify product requirements. However, delivering high quality products, depends not only on gaining an understanding of functional requirements, but also of qualities such as performance, reliability, security, and usability. Discovering such concerns early in the requirements process drives architectural design decisions. This paper extends our prior work on mining functional requirements from large collections of domain documents, by proposing and evaluating a new technique for discovering and specifying quality concerns related to specific functional components. We evaluate our approach against three domains of Positive Train Control, Electronic Health Records, and Medical Infusion Pumps, and show that it significantly outperforms a basic information retrieval approach. Finally we classified the forms of retrieved information, discussed the utility of different types, and conducted a small study with an experienced engineer to investigate the quality of requirements produced using our approach. © 2017 IEEE. |
| 54 | [No author name available] | Proceedings - 2017 IEEE 25th International Requirements Engineering Conference, RE 2017 | 2017 | The proceedings contain 81 papers. The topics discussed include: a little bird told me: mining tweets for requirements and software evolution; SAFE: a simple approach for feature extraction from app descriptions and app reviews; a framework for improving the verifiability of visual notation design grounded in the physics of notations; feedback gathering from an industrial point of view; users � the hidden software product quality experts?: a study on how app users report quality aspects in online reviews; what requirements knowledge do developers need to manage change in safety-critical systems?; datasets from fifteen years of automated requirements traceability research: current state, characteristics, and quality; safety-focused security requirements elicitation for medical device software; reinforcing security requirements with multifactor quality measurement; modeling and reasoning with changing intentions: an experiment; how much undocumented knowledge is there in agile software development?: case study on industrial project using issue tracking system and version control system; software requirements analyst profile: a descriptive study of Brazil and Mexico; improving the identification of hedonic quality in user requirements � a controlled experiment; usability insights for requirements engineering tools: a user study with practitioners in aeronautics; a case study on evaluating the relevance of some rules for writing requirements through an online survey; and a formalization method to process structured natural language to logic expressions to detect redundant specification and test statements. |
| 55 | Mattson D.C. | Usability evaluation of the digital anger thermometer app | 2017 | The digital anger thermometer is a prototype for a mobile application (app) for use with adults in anger management treatment. The digital anger thermometer incorporates standards of software development in addition to anger management resources from the Substance Abuse and Mental Health Services Administration. The digital anger thermometer underwent a usability study conducted by five expert reviewers. The results indicate that it is easy to learn, efficient, and ergonomically sound. However, it does not offer support features or user-error tolerance. The digital anger thermometer prototype requires additional usability studies and comparative research in order for it to become an actual mental health app. © The Author(s) 2016. |
| 56 | Geri F., Cainelli O., Salogni G., Zatelli P., Ciolli M. | Screening of environmental impact of pollution with the qgis plugin envifate | 2017 | Public and academic interest in environmental pollution caused by toxic substances and other sources, like noise, is constantly raising. To protect public health and ecosystems it is necessary to maintain the concentrations of pollutants below a safety threshold. In this context the development of models able to assess environmental pollution impact has been identified as a priority for future research. Scientific community has therefore produced many predictive models in the field. The vast majority of them needs to be run by specialists with a deep technical knowledge of the modeled phenomena in order to process the data and understand the results and it is not feasible to use this models for simple prescreening activities. Planners, evaluators and technical operators need reliable, usable and simple tools in order to carry out screening analysis of impact assessment. The ENVIFATE software is currently under development by the Department of Civil, environmental and mechanical engineering of the University of Trento, Italy, in the frame of a project funded by the Italian Veneto Region with the aim to make available to non-specialists screening analysis to assess the risks of a set of possible environmental pollution sources in protected areas. The development of ENVIFATE follows these basic requirements: i) Open-Source ii) multiplatform iii) user friendly iv) GIS oriented. In order to respect these principles we have chosen to develop a plugin of QGIS, using python as a development language and creating a module for each environmental compartment analyzed: rivers, lakes, atmospheric dispersion, dispersion in groundwater and noise. The plugin architecture is composed of a series of core functions characterized by command line interfaces that can be called from third-party applications (such as Grass GIS), connectable in custom data flows and with a high level of modularity and scalability. The base of the different models are highly tested and reliable algorithms adopted by the Italian Institute for Protection and Environmental Research (Istituto Superiore per la Protezione e la Ricerca Ambientale - ISPRA). Due to their simplicity, and for safety reasons, the structure of these models is constrained to provide conservative results, so to overestimate actual risk. This approach allows to provide statistically validated instruments to be used in different environmental contexts. All modules of the plugin provide numerical and cartographical results: in particular the command-line interface provides "static" results, or linked to a particular spatial and temporal state, while the Qgis plugins iterate the single analysis along space and time in order to provide geo-referenced maps and time distributed results. © Authors 2017. |
| 57 | Huang M.E. | IT Is From Mars and Physicians From Venus: Bridging the Gap | 2017 | With increasing adoption of electronic health records (EHRs) and legislative mandates for its use within the United States, collaboration between physicians and information technology (IT) staff is essential. Current challenges that physicians face include addressing EHR usability, system performance, adequate training, issue resolution, regulatory compliance, and lack of awareness of IT roles. These challenges lead to gaps in communication between clinicians and IT staff. Strategies to improve collaboration between physicians and IT staff include increasing physician involvement with health information technology software development, involvement with legislative regulations and standards, IT project implementation, as well as system stabilization and optimization. Other key strategies to improve collaboration are also addressed, including proper leadership support, proper training, and proper issue triage. Improved collaboration can result in more effective EHR design and implementation which in turn can enhance the end user experience and patient care. © 2017 American Academy of Physical Medicine and Rehabilitation |
| 58 | Nogueira T.C., Ferreira D.J., Carvalho S.T., Berreta L.O. | Evaluating Responsive Web Design's Impact on Blind Users | 2017 | Recent studies show that websites complying with accessibility guidelines can still be ineffective, inefficient, and unpleasant. Compliance with accessibility guidelines does not guarantee blind users' satisfaction when accessing websites. Meanwhile, in recent years, websites have undergone radical changes regarding design, development, and construction. Responsive design is a new trend that has a strong impact on web design. To determine blind users' experience with responsive design, the authors performed empirical tests to investigate the impact of responsive design on the emotions of blind users during web interactions. They measured user emotions by applying the Positive and Negative Affect Schedule (PANAS) instrument. Results show that although the responsive websites investigated had acceptable levels of accessibility, they posed numerous usability barriers and triggered intense, negative user emotions. Furthermore, the average number of negative emotional reactions for blind users was higher in the case of responsive web design than in the case of nonresponsive web design. © 1994-2012 IEEE. |
| 59 | Smaradottir B.F. | The steps of user-centered design in health information technology development: Recommendations from a PhD research study | 2017 | This study was carried out to explore the steps of User-centered Design in development of health information technology. The technology was developed in two research projects: the European Union project United4Health that created a collaborative telemedicine system for remote monitoring of Chronic Obstructive Pulmonary Disease and the Southern Norway regional project eHealth-extended Care Coordination that built an information system for coordination in inter-municipal health care teams. In both projects, the end-users were involved as active contributors in a User-centered Design process spanning from idea-generation until final deployment stages. This paper presents the steps in the User-centered Design process, based on the results of an empirical PhD research study. © 2016 IEEE. |
| 60 | Gray J., Banhazi T.M., Kist A.A. | Wireless data management system for environmental monitoring in livestock buildings | 2017 | The impact of air quality on the health, welfare and productivity of livestock needs to be considered, especially when livestock are kept in enclosed buildings. The monitoring of such environmental factors allows for the development of appropriate strategies to reduce detrimental effects of sub-optimal air quality on the respiratory health of both livestock and farmers. In 2009, an environmental monitoring system was designed, developed and tested that allowed for the monitoring of a number of airborne pollutants. One limitation of the system was the manual collection of logged data from each unit. This paper identifies limitations of the current environmental monitoring system and suggests a range of networking technologies that can be used to increase usability. Consideration is taken for the networking of environmental monitoring units, as well as the collection of recorded data. Furthermore, the design and development of a software system that is used to collate and store recorded environmental data from multiple farms is explored. In order to design such a system, simplified software engineering processes and methodologies have been utilised. The main steps taken in order to complete the project were requirements elicitation with clients, requirements analysis, system design, implementation and finally testing. The outcome of the project provided a potential prototype for improving the environmental monitoring system and analysis informing the benefit of the implementation. © 2017 China Agricultural University |
| 61 | Luna D.R., Rizzato Lede D.A., Otero C.M., Risk M.R., González Bernaldo de Quirós F. | User-centered design improves the usability of drug-drug interaction alerts: Experimental comparison of interfaces | 2017 | Clinical Decision Support Systems can alert health professionals about drug interactions when they prescribe medications. The Hospital Italiano de Buenos Aires in Argentina developed an electronic health record with drug-drug interaction alerts, using traditional software engineering techniques and requirements. Despite enhancing the drug-drug interaction knowledge database, the alert override rate of this system was very high. We redesigned the alert system using user-centered design (UCD) and participatory design techniques to enhance the drug-drug interaction alert interface. This paper describes the methodology of our UCD. We used crossover method with realistic, clinical vignettes to compare usability of the standard and new software versions in terms of efficiency, effectiveness, and user satisfaction. Our study showed that, compared to the traditional alert system, the UCD alert system was more efficient (alerts faster resolution), more effective (tasks completed with fewer errors), and more satisfying. These results indicate that UCD techniques that follow ISO 9241-210 can generate more usable alerts than traditional design. © 2017 Elsevier Inc. |
| 62 | Abdalla R., Mishra A. | Application of agent methodology in healthcare information systems | 2017 | This paper presents a case study to describe the features and the phases of the two agent methodologies. The Gaia methodology for agent oriented analysis and design, Tropos is a detailed agent oriented software engineering methodology to explore each methodology's ability to present solutions for small problems. Also we provide an attempt to discover whether the methodology is in fact understandable and usable. In addition we were collecting and taking notes of the advantages and weaknesses of these methodologies during the study analysis for each methodology and the relationships among their models. The Guardian Angle: Patient-Centered Health Information System (GA: PCHIS) is the personal system to help track, manage, and interpret the subject's health history, and give advice to both patient and provider is used as the case study throughout the paper. © 2017 Reem Abdalla, Alok Mishra. |
| 63 | Aljaber T., Gordon N. | A guidance and evaluation approach for mHealth education applications | 2017 | A growing number of mobile applications for health education are being utilized to support different stakeholders, from health professionals to software developers to patients and more general users. There is a lack of a critical evaluation framework to ensure the usability and reliability of these mobile health education applications (MHEAs). Such a framework would facilitate the saving of time and effort for the different user groups. This paper describes a framework for evaluating mobile applications for health education, including a guidance tool to help different stakeholders select the one most suitable for them. The framework is intended to meet the needs and requirements of the different user categories, as well as improving the development of MHEAs through software engineering approaches. A description of the evaluation framework is provided, with its efficient hybrid of selected heuristic evaluation (HE) and usability evaluation (UE) factors. Lastly, an account of the quantitative and qualitative results for the framework applied to the Medscape and other mobile apps is given. This proposed framework - an Evaluation Framework for Mobile Health Education Apps - consists of a hybrid of five metrics selected from a larger set during heuristic and usability evaluation, the choice being based on interviews with patients, software developers and health professionals. © Springer International Publishing AG 2017. |
| 64 | Batarseh F.A., Pithadia J. | Context-aware user interfaces for intelligent emergency applications | 2017 | The importance of context in many recent software engineering research studies has been rising significantly. Injecting context awareness into software systems has facilitated multiple facets of modelling, increasing user satisfaction, and increased the level of User Interface (UI) intelligence. Context has been a major part of traditional Artificial Intelligence (AI), lately however, it is being deployed to a wider spectrum of research topics such as human cognition, the internet of things, software usability and many others. In this paper, a new context-aware method for emergency applications is introduced. An emergency is a situation that poses an immediate risk to life, health, property or environment. There is an obvious gap in applying context to such critical cases; this paper shows that context awareness in user interfaces can play an important role with notifications and improving human reactions during such unfortunate and unforeseen incidents. The proposed method is evaluated through live emergency drills and simulations, the experimental results are presented. © Springer International Publishing AG 2017. |
| 65 | Egyedi A.L., O’Connor M.J., Martínez-Romero M., Willrett D., Hardi J., Graybeal J., Musen M.A. | Embracing Semantic Technology for Better Metadata Authoring in Biomedicine | 2017 | The Center for Expanded Data Annotation and Retrieval (CEDAR) has developed a suite of tools and services that allow scientists to create and publish metadata describing scientific experiments. Using these tools and services—referred to collectively as the CEDAR Workbench—scientists can collaboratively author metadata and submit them to public repositories. A key focus of our software is semantically enriching metadata with ontology terms. The system combines emerging technologies, such as JSON-LD and graph databases, with modern software development technologies, such as microservices and container platforms. The result is a suite of user-friendly, Web-based tools and REST APIs that provide a versatile end-to-end solution to the problems of metadata authoring and management. This paper presents the architecture of the CEDAR Workbench and focuses on the technology choices made to construct an easily usable, open system that allows users to create and publish semantically enriched metadata in standard Web formats. |
| 66 | Núñez-Nava J., Orozco-Sánchez P.A., López D.M., Ceron J.D., Alvarez-Rosero R.E. | Human-centered development of an online social network for metabolic syndrome management | 2017 | Problem: According to the International Diabetes Federation (IDF), a quarter of the world's population has Metabolic Syndrome (MS). Objective: To develop (and assess the users' degree of satisfaction of) an online social network for patients who suffer from Metabolic Syndrome, based on the recommendations and requirements of the Human-Centered Design. Results: Following the recommendations of the ISO 9241-210 for Human-Centered Design (HCD), an online social network was designed to promote physical activity and healthy nutrition. In order to guarantee the active participation of the users during the development of the social network, a survey, an in-depth interview, a focal group, and usability tests were carried out with people suffering from MS. Conclusions: The study demonstrated how the different activities, recommendations, and requirements of the ISO 9241-210 are integrated into a traditional software development process. Early usability tests demonstrated that the user's acceptance and the effectiveness and efficiency of the social network are satisfactory. © 2016 European Federation for Medical Informatics (EFMI) and IOS Press. |
| 67 | Lee K., Jung S.Y., Hwang H., Yoo S., Baek H.Y., Baek R.-M., Kim S. | A novel concept for integrating and delivering health information using a comprehensive digital dashboard: An analysis of healthcare professionals’ intention to adopt a new system and the trend of its real usage | 2017 | Objective To introduce a new concept of medical dashboard system called BESTBoard. Such a system was implemented in all wards in a tertiary academic hospital to explore the development process, core designs, functions, usability and feasibility. Methods The task-force team made user interface designs for 6 months based on a need analysis. Hardware configuration and software development was carried out for 3 months. We conducted a survey of 383 physicians and nurses to determine the usability and feasibility of the system. Results In March 2012, the system was installed in all wards, including the intensive care units, emergency rooms, operation rooms, and even delivery rooms. Healthcare professionals had access to all information of EHRs optimized for a large 55-inch touchscreen. The satisfaction rate of BESTBoard users was high, with a mean of 3.3 points. Voluntary users tended to consider BESTBoard as a good system that is useful for team round visits, interdisciplinary team approach, and collecting the status of the hospital rooms. Elderly users didn't tend to think of BESTBoard as a useful tool for interdisciplinary team approach and collecting the status of the hospital rooms. Greater expectations regarding work performance affected the users' attitudes positively. A positive attitude toward using the system resulted in consistent real usage and health care professionals' satisfaction with the new dashboard system. Conclusions A new concept of hospital dashboard system proved to be feasible and useful in delivering health information to healthcare professionals. A positive attitude and an expectation regarding work performance were important factors for intention to use the system. This finding can serve for developing new systems to present health information effectively. Further studies will be needed to evaluate the extent to which BESTBoard can have a positive impact on clinical care outcomes and work performance. © 2016 |
| 68 | Llerena L., Rodríguez N., Gómez-Abajo P., Castro J.W. | How to apply the user profile usability technique in the user modelling activity for an adaptive food recommendation system for people on special diets | 2017 | Interest among software professionals in the possibility of adapting software to user requirements has grown as a result of the evolution of software analysis, design and implementation thinking and the growth in the number of software systems users. Moving away from the traditional approach where the user has to settle for the options offered by software systems, different factors, like user needs, aspirations, preferences, knowledge level, goals and other distinguishing features, have to be taken into account for this purpose. Technically, this possibility is referred to as adaptiveness, and it requires user data. It is these data (user model) that determine the adaptiveness conditions. Our aim is to build a user model for adaptive systems applied to nutritional requirements, modelling user characteristics that affect their diets and help to improve their health. To build the user model, we apply the user profile usability technique. In order to validate our proposal, we analyse and design a preliminary prototype of an adaptive system capable of making food recommendations to satisfy specific user needs. This study revealed that diet is a propitious field for the development of adaptive systems and that user modelling is a good choice for design of this type of systems. |
| 69 | Namías R., D'Amato J.P., Del Fresno M. | Open-source software platform for medical image segmentation applications | 2017 | Segmenting 2D and 3D images is a crucial and challenging problem in medical image analysis. Although several image segmentation algorithms have been proposed for different applications, no universal method currently exists. Moreover, their use is usually limited when detection of complex and multiple adjacent objects of interest is needed. In addition, the continually increasing volumes of medical imaging scans require more efficient segmentation software design and highly usable applications. In this context, we present an extension of our previous segmentation framework which allows the combination of existing explicit deformable models in an efficient and transparent way, handling simultaneously different segmentation strategies and interacting with a graphic user interface (GUI). We present the object-oriented design and the general architecture which consist of two layers: the GUI at the top layer, and the processing core filters at the bottom layer. We apply the framework for segmenting different real-case medical image scenarios on public available datasets including bladder and prostate segmentation from 2D MRI, and heart segmentation in 3D CT. Our experiments on these concrete problems show that this framework facilitates complex and multi-object segmentation goals while providing a fast prototyping open-source segmentation tool. © 2017 SPIE. |
| 70 | Pezzuol J.L., Abreu F.D.L., Silva S.M., Tendolini A., Bissaco M.A.S., Rodrigues S.C.M. | Virtual setting for training in interpreting mammography images | 2017 | This work presents a web system for the training of students or residents (users) interested in the detection of breast density in mammography images. The system consists of a breast imaging database with breast density types classified and demarcated by the specialist (tutor) or online database. The planning was based on ISO / IEC 12207. Through the browser (desktop or notebook), the user will visualize the breast images and in them will realize the markings of the density region and even classify them per the BI-RADS protocol. After marking, this will be compared to the gold standard already existing in the image base, and then the system will inform if the area demarcation has been set or not. The shape of this marking is similar to the paint brush. The evaluation was based on ISO / IEC 1926 or 25010: 2011 by 3 software development specialists and 3 in mammary radiology, evaluating usability, configuration, performance and System interface through the Likert scale-based questionnaire. Where they have totally agreed on usability, configuration, performance and partially on the interface. And as a good thing: the system is able to be accessed anywhere and at any time, the hit or error response is in real time, it can be used in the educational area, the limit of the amount of images will depend on the size of the computer memory, At the end the system sends the results achieved by e-mail to the user, reproduction of the system on any type of screen, complementation of the system with other types of breast structures. Negative points are the need for internet. © 2017 SPIE. |
| 71 | Masci P., Zhang Y., Jones P., Campos J.C. | A hazard analysis method for systematic identification of safety requirements for user interface software in medical devices | 2017 | Formal methods technologies have the potential to verify the usability and safety of user interface (UI) software design in medical devices, enabling significant reductions in use errors and consequential safety incidents with such devices. This however depends on comprehensive and verifiable safety requirements to leverage these techniques for detecting and preventing flaws in UI software that can induce use errors. This paper presents a hazard analysis method that extends Leveson’s System Theoretic Process Analysis (STPA) with a comprehensive set of causal factor categories, so as to provide developers with clear guidelines for systematic identification of use-related hazards associated with medical devices, their causes embedded in UI software design, and safety requirements for mitigating such hazards. The method is evaluated with a case study on the Gantry-2 radiation therapy system, which demonstrates that (1) as compared to standard STPA, our method allowed us to identify more UI software design issues likely to cause use-related hazards; and (2) the identified UI software design issues facilitated the definition of precise, verifiable safety requirements for UI software, which could be readily formalized in verification tools such as Prototype Verification System (PVS). © Springer International Publishing AG (outside the US) 2017. |
| 72 | Chittaro L., Vianello A. | Mobile mindfulness and user's worry: A qualitative study of using a smartphone app for distancing from negative thoughts | 2016 | Mindfulness is attracting an increasing interest due to its health and well-being benefits, but its practice can be difficult for people with no or minimal experience with meditation. In this study, we aim at thoroughly investigating participants' user experience with a mobile mindfulness app (AEON). In particular, we focus on perceptions in using the app for ameliorating worry, as well as on understanding in situ usage. We employ thematic analysis to qualitatively analyze participants' interviews at the end of a 5-week study period. Results indicate that several participants experienced decentering from their worries when using the app. Moreover, AEON was perceived as easy and pleasant to use. However, results also highlight that some participants did not experience decentering from all or some of their worries, and we discuss the possible reasons. Finally, unexpected patterns of use, user's suggestions and some usability problems emerged from the study, allowing us to identify some design opportunities for mindfulness apps. © 2016 The Author 2016. Published by Oxford University Press on behalf of The British Computer Society. |
| 73 | Trauzettel F., Minge M. | Usability in the lifecycle of medical software development | 2016 | A close cooperation with users is necessary to ensure that interactive systems are robust, easy to use and accepted. Therefore, in medical technology, standards for usability are of fundamental importance. We investigated with the presented study how the concept of usability is currently understood and implemented in medical software companies. Interviews were conducted with 21 employees of German enterprises. Furthermore we extended an already existing quantitative online survey where 53 companies (including 24 from the health industry sector) participated in. Results show that the importance of usability is recognized by most of the respondents. Moreover, a wide variety of methods and approaches is known and implemented for exploring user needs and evaluating system prototypes. However, it was observed that human-centered design activities mainly focus on functionality, risk prevention and accessibility. Hedonic user needs and subjective perceptions (“user experience”) still play a minor role. Based on the results, practical requirements are derived and a “best case” for methodological approach is introduced. © 2016 Franziska Trauzettel et al., licensee De Gruyter. |
| 74 | Hussain A., Mkpojiogu E.O.C., Nawi M.N.M. | Requirements model for an e-Health awareness portal | 2016 | Requirements engineering is at the heart and foundation of software engineering process. Poor quality requirements inevitably lead to poor quality software solutions. Also, poor requirement modeling is tantamount to designing a poor quality product. So, quality assured requirements development collaborates fine with usable products in giving the software product the needed quality it demands. In the light of the foregoing, the requirements for an e-Ebola Awareness Portal were modeled with a good attention given to these software engineering concerns. The requirements for the e-Health Awareness Portal are modeled as a contribution to the fight against Ebola and helps in the fulfillment of the United Nation's Millennium Development Goal No. 6. In this study requirements were modeled using UML 2.0 modeling technique. © 2016 Author(s). |
| 75 | Shi G., Zhang S., Liu X., Zhou B. | A mobile medical application design model in social perspective | 2016 | Medical applications on the market showed the following deficiencies: main function is too single, social function and medical file function is not perfect, poor social attributes, simple transplantation of traditional medical mode can't satisfy the user's multi-level and in-depth continued demand for health care. We put forward SMA social medical applications, combined with social and medical organic as a whole, the health record as a bridge to connect mobile health care and general health. With the idea of social medical treatment to narrow the doctor-patient relationship as a friend, to simplify the dual business logic. Task completion experiments verify the usability of the SMA model for social medical treatment, using the User Experience Cellular Model proposed by Peter Morville to evaluate the experimental validation of the SMA model can achieve a better user experience. © 2016 IEEE. |
| 76 | Regan G., Flood D., Mc Caffery F. | Research findings from an industrial trial of a traceability assessment and implementation framework | 2016 | Software systems are becoming increasingly complex. Within safety critical domains such as medical device software, this increasing complexity is placing growing demands on manufacturers who must ensure their software not only meets functional requirements but is also safe and reliable. However, the Food and Drugs Administration who regulate medical device software in the United States report a significant increase in recalls between years 2003 and 2012 and have cited software difficulties as one of the frequent causes of recalls. Furthermore a recent analysis of traceability documentation submitted to the Administration has revealed that the traceability data was incomplete, incorrect, and conflicting in many cases. This is problematic as traceability plays an important role in the development of safe and reliable software. In this paper we present the validation, through industry trial, of a traceability assessment and implementation framework which we have developed to assist medical device organizations implement traceability in an efficient and regulatory compliant manner. Our findings show that implementation of the framework within two organizations improved their traceability process and that both organizations found the framework to be both useful and usable. © 2016, Association for Computing Machinery, Inc. All rights reserved. |
| 77 | Feary M., Martinie C., Palanque P., Tscheligi M. | Multiple views on safety-critical automation: Aircrafts, autonomous vehicles, air traffic management and satellite ground segments perspectives | 2016 | This SIG focuses on the engineering of automation in interactive critical systems. Automation has already been studied in a number of (sub-) disciplines and application fields: design, human factors, psychology, (software) engineering, aviation, health care, games. One distinguishing feature of the area we are focusing on is that in the field of interactive critical systems properties such as reliability, dependability, faulttolerance are as important as usability, user experience or overall acceptance issues. The SIG targets at two problem areas: first the engineering of the user interaction with (partly-) autonomous systems: how to design, build and assess autonomous behavior, especially in cases where there is a need to represent on the user interface both autonomous and interactive objects. An example of such integration is the representation of an unmanned aerial vehicle (UAV) (where no direct interaction is possible), together with aircrafts (that have to be instructed by an air traffic controller to avoid the UAV). Second the design and engineering of user interaction in general for autonomous objects/systems (for example a cruise control in a car or an autopilot in an aircraft). The goal of the SIG is to raise interest in the CHI community on the general aspects of automation and to identify a community of researchers and practitioners interested in those increasingly prominent issues of interfaces towards (semi)-autonomous systems. The expected audience should be interested in addressing the issues of integration of mainly unconnected research domains to formulate a new joint research agenda. © 2016 Authors. |