Bibliography Summary

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Summary

In the research paper Evaluation of mobile app paradigms [Hv12], the authors main purpose is to help the audiences understand the four main mobile application paradigms which is mobile native applications, mobile widgets, mobile web applications, and HTML5 mobile applications. "A mobile native application or native app is an application specifically developed to execute on a specific device platform" [Hv12]. Mobile widget is a quicker way to access new, podcast, or weather content. Mobile web application is used to deliver information and services. The World Wide Web Consortium (W3C) has defined HTML5 as a set of capabilities that can do all of the jobs that existing technologies can handle in mobile Web apps. The authors evaluation: for developer, the easiest application to develop is widget; for user, the easiest application to use is native apps; for the service provider, HTML5 have the advantage of distribution. In conclusion, the authors believe that "HTML5 mobile apps keep their first places in the race of mobile paradigms" [Hv12]. The authors also predict that mobile web app will soon become history and replaced by HTML5 mobile app.

The paper "Software engineering issues for mobile application development" [Was10] presents an overview of key software engineering research challenges relating to the development of mobile app development. The authors pointed out some additional requirement that mobile applications need such as potentially interact with other apps, sensing handling, native and hybrid, security, complexity of testing, and power consumption. The paper suggests the best practice for mobile application is agile approach. The authors think that there are a lot of space for researching in mobile development area namely user-experience , non-functional requirements, as well as process, tool, and architecture. "While the large number of mobile applications makes it appear that software development processes for them are well understood, there remain a large number of complex issues where further work is needed."[Was10], the author concluded.

In the paper "What can Android mobile app developers do about the energy consumption of machine learning?", the author introduce some API and library that used to implement machine learning algorithm with mobile app. One example of the framework that can use machine learning algorithm with mobile

app is Neural Networks API. Apple has released CoreML (Inc. 2017) for iOS [MHH19]. The author also introduce apps that employ machine learning like Google Play Crawler and App Brain. One of the main concern of using such an enormous amount of data is the energy that would cost for the mobile device. The author concluded that Naïve Bayes and J48 are the best algorithm implementations tested to use for applications trying to reduce energy use [MHH19]. If we're focus more on accuracy, the author suggested MLP had the highest average accuracy overall, with an average classification accuracy of over 95% and an average kappa of over 0.92. [MHH19]. The researcher concluded that different learning algorithm do different thing, it is up to developers choose how to use it.

In the article "The mobile apps industry: A case study", the author discussed about the evolution, the basic, the impact of the mobile app industry. The different between Android app and iPhone app [REK13]. They also discussed the market place of big tech like Facebook, Amazon, Niche and the consumer reference. Revenue that these app generated. Network provider play an important role in order for these big tech to be successful. The author also brought up security and privacy, the primary user concerned. They also did some research about trends and predict the future. Based on the research, mobile app consumption has beaten web application consumption by 8%.

Many smartphone apps collect potentially sensitive personal data and send it to cloud servers. However, most mobile users have a poor understanding of why their data is being collected. We present MobiPurpose, a novel technique that can take a network request made by an Android app and then classify the data collection purposes, as one step towards making it possible to explain to non-experts the data disclosure contexts. Our purpose inference works by leveraging two observations: 1) developer naming conventions (e.g., URL paths) of ten offer hints as to data collection purposes, and 2) external knowledge, such as app metadata and information about the domain name, are meaningful cues that can be used to infer the behavior of different traffic requests. MobiPurpose parses each traffic request body into key-value pairs, and infers the data type and data collection purpose of each key-value pair using a combination of supervised learning and text pattern bootstrapping. We evaluated MobiPurpose's effectiveness using a dataset cross-labeled by ten human experts. Our results show that MobiPurpose can predict the data collection purpose with an average precision of 84% (among 19 unique categories).[Jin+18]

—It is a new world that we are living in: The "App Generation" has come. The term "app" is a shortening of the term "mobile application." It refers to software applications designed to run on smartphones, tablet computers and other mobile devices. Most mobile apps are free, yet the increasing growth of apps has yielded a number of different revenue models to reap huge profits, such as the instant messaging app WhatsApp Messenger and the gaming app Puzzle & Dragons. Studies of these app business models (ABMs) have not been extensive in the literature. Abundant research has examined apps as a promotional

tool in mobile advertising or mobile marketing, but not as a business model to generate revenue. The app business is an evolving market and research on ABMs is essential to reveal the contemporary situation and critical success factors in implementing and monetizing an ABM. This study aims to investigate whether there exist different ABMs and what factors app users consider important when they use and pay for an app. In-depth interviews and focus groups with apps users and app enterprises were carried out. We found app users have different attitudes about and evaluations of various types of apps. Users look more for utilitarian benefits such as aesthetic appeal and perceived ease of use in apps such as maps, news and fitness; while they focus more on hedonic benefits such as personal emotional attachment and achievement component in gaming and social media apps. The findings of this study will provide insight to practitioners in developing features and benefits to meet app users' increasing expectations and requirements. [Tan16]

In the current age of the Fourth Industrial Revolution (4IR or Industry 4.0), the digital world has a wealth of data, such as Internet of Things (IoT) data, cybersecurity data, mobile data, business data, social media data, health data, etc. To intelligently analyze these data and develop the corresponding smart and automated applications, the knowledge of artificial intelligence (AI), particularly, machine learning (ML) is the key. Various types of machine learning algorithms such as supervised, unsupervised, semi-supervised, and reinforcement learning exist in the area. Besides, the deep learning, which is part of a broader family of machine learning methods, can intelligently analyze the data on a large scale. In this paper, we present a comprehensive view on these machine learning algorithms that can be applied to enhance the intelligence and the capabilities of an application. Thus, this study's key contribution is explaining the principles of different machine learning techniques and their applicability in various real-world application domains, such as cybersecurity systems, smart cities, healthcare, e-commerce, agriculture, and many more. We also highlight the challenges and potential research directions based on our study. Overall, this paper aims to serve as a reference point for both academia and industry professionals as well as for decision-makers in various real-world situations and application areas, particularly from the technical point of view. [Sar21]

This paper presents the uses and effect of mobile application in individuals, business and social area. In modern information and communication age mobile application is one of the most concerned and rapidly developing areas. This paper demonstrates that how individual mobile user facilitate using mobile application and the popularity of the mobile application. Here we are presenting the consequence of mobile application in business sector. Different statistical data of the past and present situation of mobile application from different parts of the world has been presented here to express the impact. This paper also presents some effect of mobile application on society from the ethical perspective. [IIM10]

Software organizations are nowadays facing increased demand for modernizing their legacy software systems using up-to-date technologies. The combination of Model-Driven Development and delivery models like Cloud and Software as a Service have become a very promising approach for software modernization that possesses a lot of advantages, including great deal of automation and reuse of system functionality. However, the use of such new and immature technologies is very challenging and requires a comprehensive methodology for their seamless application within the software modernization projects. When developing such methodology, questions on whether agile methods and techniques should be incorporated and what could be the benefits and implications from that become of particular interest. To help answering these questions, the paper evaluates the potential of agile methods and techniques to address the challenges of Model-Driven Modernization. The challenges are extracted through a systematic review of the existing body of literature on Model-Driven Development and Software Modernization, and the evaluation is conducted through the Delphi technique. As a result, a ranked list of applicable agile techniques is proposed and suggestions for their use in Model-Driven Modernization are made.[SKI13]

Umple is an open-source software modeling tool and compiler. It incorporates textual language constructs for UML modeling, including associations and state machines. It includes traits, aspects, and mixins for separation of concerns. It supports embedding methods written in many object-oriented languages, enabling it to generate complete multilingual systems. It provides comprehensive analysis of models and generates many kinds of diagrams, some of which can be edited to update the Umple code. Umple runs on the command line, in a web browser or in integrated development environments. It is designed to help developers reduce code volume, while they develop in an agile, model-driven manner. Umple is also targeted at educational users where students are motivated by its ability to generate real systems from their software models. [Let+21]

In a world where the industry of mobile applications is continuously expanding and new health care apps and devices are created every day, it is important to take special care of the collection and treatment of users' personal health information. However, the appropriate methods to do this are not usually taken into account by apps designers and insecure applications are released. This paper presents a study of security and privacy in mHealth, focusing on three parts: a study of the existing laws regulating these aspects in the European Union and the United States, a review of the academic literature related to this topic, and a proposal of some recommendations for designers in order to create mobile health applications that satisfy the current security and privacy legislation. This paper will complement other standards and certifications about security and privacy and will suppose a quick guide for apps designers, developers and researchers. [MDL15]

The mobile application (app) industry has grown tremendously over the past ten years, primarily fueled by small app development businesses. Lacking advertising budgets, these small and relatively unknown businesses often offer free versions of their paid apps to be noticed in the crowded app industry

and to reduce customer uncertainty about app quality and fit. The authors build on the existing marketing and information systems literature on sampling and versioning to investigate the implications of offering free versions for the adoption speed of paid apps. Using a unique data set of 7.7 million observations from 12,315 paid apps, and accounting for endogeneity, the authors find that although the practice of offering free versions of paid apps is popular, it is negatively associated with paid app adoption speed. They also find that this negative association between free version presence and paid app adoption speed is stronger both for hedonic apps and in the later life stages of paid apps. The authors hope that the study's results will encourage app developers to reevaluate their current strategy of offering free versions of paid apps and prompt academics to produce more work focusing on this industry.[ATM17]

Explorations into today's labour context reveal a wide schism between those workers who live under conditions of precarity and contingency and those who seem to be living the dream – and not only in terms of wages. The standardized work day and Taylorized division of labour that characterized most of the industrial era has transitioned, at least in large part, into a regime of flexibility and insecurity that reconstitutes not only working but lifestyle conditions. This paper is intended as an initial conceptual investigation of a dual trend in the conditions of labour under digital capitalism: the rise of contractual contingency and insecurity and the introduction of fun and hipness into the office environment as a means of work intensification. [And16]

This paper provides a multi-disciplinary overview of the research issues and achievements in the field of Big Data and its visualization techniques and tools. The main aim is to summarize challenges in visualization methods for existing Big Data, as well as to offer novel solutions for issues related to the current state of Big Data Visualization. This paper provides a classification of existing data types, analytical methods, visualization techniques and tools, with a particular emphasis placed on surveying the evolution of visualization methodology over the past years. Based on the results, we reveal disadvantages of existing visualization methods. Despite the technological development of the modern world, human involvement (interaction), judgment and logical thinking are necessary while working with Big Data. Therefore, the role of human perceptional limitations involving large amounts of information is evaluated. Based on the results, a non-traditional approach is proposed: we discuss how the capabilities of Augmented Reality and Virtual Reality could be applied to the field of Big Data Visualization. We discuss the promising utility of Mixed Reality technology integration with applications in Big Data Visualization. Placing the most essential data in the central area of the human visual field in Mixed Reality would allow one to obtain the presented information in a short period of time without significant data losses due to human perceptual issues. Furthermore, we discuss the impacts of new technologies, such as Virtual Reality displays and Augmented Reality helmets on the Big Data visualization as well as to the classification of the main challenges of integrating the technology.

Mobile apps are increasingly realized by using a cross-platform development

framework. Using such frameworks, code is written once but the app can be deployed to multiple platforms. Despite progress in research on cross-platform techniques, results (i.e. apps) are not always satisfactory. They are subject to tedious tailoring and the development effort tends to be notable. In these cases, either pure web apps (realized through web browsers) or native apps (realized for each platform separately) are chosen. Recent activities have led to new approaches. In this paper, we have a closer look at three of these, namely React Native, the Ionic Framework, and Fuse. We present a comprehensive analysis of the three approaches. Our work is based on a real-world use case, which allows us to provide generalizable advice. Our findings suggest that there is no clear winner; the frameworks incorporate notable ideas and general progress in the field can be asserted. [MG17]

Mobile apps (applications) provide services such as information dissemination, knowledge promotion, social media integration, and online shopping, all of which are platforms that enable the strengthening of communication and foster interaction between firms and consumers. The related pieces of literature on the continuous use of mobile apps have noted that apps must have convenience, unique value, social value, incentives, entertainment, and other such qualities to attract continuous usage by customers. As such, stickiness has become the key factor in the business success of apps. For businesses managing mobile apps, the topics of how to design content for mobile device users, how to measure media value and returns, and how to capture the attention of users and make them willing to spend more time using the application are all worthy of exploration. This study proposes the analytical model for mobile app stickiness to measure the significance of various influencing factors of the hierarchical structure and to measure the performance of mobile apps. The study explored key factors that affected user stickiness while examining usage statistics to develop management strategies geared toward mobile app sticki- ness to improve customer/user loyalty. The proposed model can function as a tool for app planners in measuring user stickiness and app performance while serving as reference for future studies into app stickiness and real-life applications. It can also clarify the influence of key factors influencing app stick- iness, which can help app planners develop appropriate strategies and function as a reference point for future improvement and optimization strategies. [HT20]

Mobile cross-platform tools (CPTs) provide an interesting alternative to native development. Cross-platform tools aim at sharing a significant portion of the application codebase between the implementations for the different platforms. This can drastically decrease the development costs of mobile applications. There is, however, some reluctance of mobile application developers to adopt these tools. One of the reasons is that the landscape of CPTs is so diverse that it is hard to select the most suitable CPT to implement a specific application. The contribution of this paper is twofold. First, it presents a performance analysis of a fully functional mobile application implemented with ten cross-platform tools and native for Android, iOS and Windows Phone. The performance tests are executed on a high- and low-end Android and iOS device,

and a Windows Phone device. Second, based on the performance analysis, general conclusions of which application developers should be aware when selecting a specific (type of) cross-platform tool are drawn. [WVN16]

Developing energy efficient mobile applications is an important goal for software developers as energy usage can directly affect the usability of a mobile device. Unfortunately, developers lack guidance as to how to improve the energy efficiency of their implementation and which practices are most useful. In this paper we conducted a small-scale empirical evaluation of commonly suggested energy-saving and performance-enhancing coding practices. In the evaluation we evaluated the degree to which these practices were able to save energy as compared to their unoptimized code counterparts. Our results provide useful guidance for mobile app developers. In particular, we found that bundling network packets up to a certain size and using certain coding practices for reading array length information, accessing class fields, and performing invocations all led to reduced energy consumption. However, other practices, such as limiting memory usage had a very minimal impact on energy usage. These results serve to inform the developer community about specific coding practices that can help lower the overall energy consumption and improve the usability of their applications. [LH14]

In this paper, The mobile application field has been receiving astronomical attention from the past few years due to the growing number of mobile app downloads and withal due to the revenues being engendered .With the surge in the number of apps, the number of lamentable apps/failing apps has withal been growing.Interesting mobile app statistics are included in this paper which might avail the developers understand the concerns and merits of mobile apps.The authors have made an effort to integrate all the crucial factors that cause apps to fail which include negligence by the developers, technical issues, inadequate marketing efforts, and high prospects of the users/consumers.The paper provides suggestions to eschew failure of apps. As per the various surveys, the number of lamentable/failing apps is growing enormously, primarily because mobile app developers are not adopting a standard development life cycle for the development of apps. In this paper, we have developed a mobile application with the aid of traditional software development life cycle phases (Requirements, Design, Develop, Test, and, Maintenance) and we have used UML, M-UML, and mobile application development technologies. [Inu+14]

An effective development model can help improve competitive advantage and shorten release cycles, which is vital in the fast paced environment of mobile app development. Objective: The aim with this paper is to provide an extensive review of existing mobile app development models. Method: The review is done by following a systematic literature review process. Also presented is an assessment of the usefulness and relevance to industry of the models based on a rigor and relevance framework. Results: 20 primary studies were identified, each with distinct models. Agile methods or state-based principles are commonly adopted across the models. Relatively little effort focuses on deployment, maintenance, project evaluation activities. Conclusion: The review reveals that the contexts

in which the identified models are intended to be used vary. This benefits practitioners as they are able to select a model that suits their contexts. However, the usefulness in industry of most of the models, based on the contexts in which the models were evaluated, is questionable. There is a need for evaluating mobile app models in contexts that resemble realistic contexts. The review also calls for further research addressing special constraints of mobile apps, e.g., testing apps on multiple-platforms, user involvement in release planning and continuous deployment.[JED18]

Advent of computationally efficient smartphones, inexpensive high-resolution cameras, drones, and robotic sensors has brought a new era of next-generation intelligent monitoring systems for civil infrastructure. Vibration-based condition assessment has garnered as a prominent method of evaluating the health of large-scale infrastructure. The use of contact-based sensors for acquiring vibration data becomes uneconomical and tedious due to their instrumentation cost, centralized nature, and densification required to collect sufficient data for system identification of modern complex structures. A need to advance and develop alternative methods for efficient sensing system results in next-generation measurement technology of structural health monitoring. The abundance of handheld smartphones with easily programmable framework has helped in modifying relevant software to acquire vibration data using embedded sensors in the smartphone. The inexpensive cameras have been used to capture images and videos that are utilized to understand the structural behavior with the aid of advanced signal processing techniques. The inaccessible components of structures require noncontact sensors such as unmanned aerial vehicles (UAVs) or so-called drones and mobile sensors to acquire structural data. To the authors' knowledge, this paper first time presents a comprehensive review of a suite of next-generation smart sensing technology that has been developed in recent years within the context of structural health monitoring. The state-of-the-art methods have been presented by conducting a detailed literature review of the recent applications of smartphones, UAVs, cameras, and robotic sensors used in acquiring and analyzing the vibration data for structural condition monitoring and maintenance.

Information about vehicle safety, such as the driving safety status and the road safety index, is of great importance to protect humans and support safe driving route planning. Despite some research on driving safety analysis, the accuracy and granularity of driving safety assessment are both very limited. Also, the problem of precisely and dynamically predicting road safety throughout a city has not been sufficiently studied and remains open. With the proliferation of sensor-equipped vehicles and smart devices, a huge amount of mobile sensing data provides an opportunity to conduct vehicle safety analysis. In this article, we first discuss mobile sensing data collection in VANETs and then identify two main challenges in vehicle safety analysis in VANETs, i.e., driving safety analysis and road safety analysis. In each issue, we review and classify the state-of-the-art vehicle safety analysis techniques into different categories. For each category, a short description is given followed by a discussion of limitations. In order to

improve vehicle safety, we propose a new deep learning framework (DeepRSI) to conduct real-time road safety prediction from the data mining perspective. Specifically, the proposed framework considers the spatio-temporal relationship of vehicle GPS trajectories and external environment factors. The evaluation results demonstrate the advantages of our proposed scheme over other methods by utilizing mobile sensing data collected in VANETs.[Pen+18]

Cameras are becoming ubiquitous in the Internet of Things (IoT) and can use face recognition technology to improve context. There is a large accuracy gap between today's publicly available face recognition systems and the state-of-the-art private face recognition systems. This paper presents our OpenFace face recognition library that bridges this accuracy gap. We show that OpenFace provides near-human accuracy on the LFW benchmark and present a new classification benchmark for mobile scenarios. This paper is intended for non-experts interested in using OpenFace and provides a light introduction to the deep neural network techniques we use[ALS+16]

In this paper, we investigate various algorithms for face recognition on mobile phones. First step in any face recognition system is face detection. We investigated algorithms like color segmentation, template matching etc. for face detection, and Eigen Fisher face for face recognition. The algorithms have been first profiled in MATLAB and then implemented on the DROID phone. While implementing the algorithms, we made a tradeoff between accuracy and computational complexity of the algorithm mainly because we are implementing the face recognition system on a mobile phone with limited hardware capabilities. [DCS10]

This review examined articles on mobile apps for science learning published from 2007 to 2014. A qualitative content analysis was used to investigate the science mobile app research for its mobile app design, underlying theoretical foundations, and students' measured outcomes. This review found that mobile apps for science learning offered a number of similar design features, including technology-based scaffolding, location-aware functionality, visual/audio representations, digital knowledge-construction tools, digital knowledge-sharing mechanisms, and differentiated roles. Many of the studies cited a specific theoretical foundation, predominantly situated learning theory, and applied this to the design of the mobile learning environment. The most common measured outcome was students' basic scientific knowledge or conceptual understanding. A number of recommendations came out of this review. Future studies need to make use of newer, available technologies; isolate the testing of specific app features; and develop additional strategies around using mobile apps for collaboration. Researchers need to make more explicit connections between the instructional principles and the design features of their mobile learning environment in order to better integrate theory with practice. In addition, this review noted that stronger alignment is needed between the underlying theories and measured outcomes, and more studies are needed to assess students' higher-level cognitive outcomes, cognitive load, and skill-based outcomes such as problem

solving. Finally, more research is needed on how science mobile apps can be used with more varied science topics and diverse audiences. [ZW16]

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