Critical Inquiry Topics  
Semester 2, AY2018/2019  
(Updated as of 2 January 2019)

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AC-01: Design of an e-learning prototype
This project requires students to design an e-learning prototype. Apart from offering domain knowledge, the prototype is intended to support peer-to-peer interactions through text, images and multi-media content sharing. An important goal of this prototype is to enrich the learning experiences of the user in an engaging and novel way. Students undertaking this project need to be interested in pedagogy, educational technology and possess screen design skills.

AC-02: Analysis of a user-driven Question-Answering System
A user-driven question-answering system is one which allows users to pose questions and receive one or more answers from fellow users of the system. This project requires students to analyze a Question-Answering system in terms of its features, functionalities and content. Students undertaking this project need to be conversant with the use of a web crawler.

AC-03: Analysis of communities
This project requires students to analyze the relationship patterns among members of an online community. Members therein may transcend geographical and cultural boundaries but are bound together to pursue mutual goals or interests. The goal of this project is to study how members are brought together, and how they co-create content for the community. Students undertaking this project need to be conversant with the use of a web crawler.

AC-04: Analysis of user-generated content
The advent of Web 2.0 has promoted active user participation. Users can now easily contribute their own content, as well as comment on others’. This project requires students to collect and analyze user-generated content. The goal is to identify themes in the content and examine the interaction patterns among users. Students undertaking this project need to be familiar with web crawling and content analysis.

AC-05: Deception on social media
Deceptions on social media have become increasingly prevalent. This project seeks to better understand the ways in which deceptions present themselves, and how users can fall prey into these deceptions. Students undertaking this project need to be familiar with basic statistical techniques.

AC-06: Rumors and rumor denials
With the rise of the Internet, false rumors are ubiquitous. As a way to combat falsehood, some users and organizations develop rumor denial messages. For rumor denials to be effective, they must be shared. This project studies the factors which affect the virality of rumor denials. Students undertaking this project need to be familiar with basic statistical techniques.

AH-01: Fake News
AH-02: Online Privacy
AH-03: Information Ethics
AH-04: Internet Governance
AH-05: Design Thinking
AH-06: UX
AH-07: Challenges SMEs face in import and export
AH-08: Food Industry in Singapore or region
AH-09: ASEAN economic integration and its impact on SMEs

BK-01: Leading through stories
In this project, students will select a notable business leader and study his/her speeches in the light of leadership and storytelling.

BK-02: Storytelling in speechmaking
This project will analyse the use of storytelling in a collection of TED talks or commencement speeches.

BL-01: The Publishing Industry and Libraries
This project is on the publishing industry: its heritage, structure and functions in Singapore and around the world. The work involves mapping the relations between libraries and publishers over time and in different places. Singapore would be the focus for students here.

BL-02: Understanding Wikipedia as a social technology
Wikipedia is much maligned in information studies circles as an inaccurate and even dangerous source of information. However, those studies which have been done suggest that its accuracy is comparable to more traditional encyclopedias. What is perhaps of more interest is the social dynamics of the organization as it represents a novel and collective approach to the dissemination of knowledge. Students undertaking projects in this area would examine, with the aid of the instructor, various aspects of these dynamics.

BL-03: Studies of the Asian Children’s literature collection of the National Library of Singapore
This is a collaborative project that involves examining the resources of the National Library’s Asian Children’s Literature Collection. Potential topics could include: values in Asian children’s literature, diaspora issues, illustration styles (history, culture, political/social influences), writing styles (history, culture, political/social influences), genre studies, Asian trickster tales, comparative stories and settings, Singapore children’s literature (may include the opportunity of interviewing the authors of such literature with the assistance of National Library staff).

CK-01: Intelligent Academic Writing Assistant – Web application to guide students in academic report writing
The Web application is being developed to guide students in structuring and writing the Introduction and Literature Review sections of research reports. The project is technical and focused on system development. A prototype system has been developed using Angular.js, and another version in React.js. The backend makes use of a MySQL database. The objective is to further develop the app to make it more useful, as well as implement new intelligent analytical functions.
Prerequisite: 1 team member must be familiar with AngularJs/ReactJs frameworks. Other team members should be familiar with database applications.

CK-02: Text mining/information extraction of police charge sheets to extract crime-related information
A Python script and Java program has been developed to extract crime particulars from police charge sheets for certain types of crimes, using regular expression patterns. The project seeks to extend the scripts/programs to other types of crimes.
Prerequisite: Familiarity with Python coding. Java programming will be useful. H6751 Text and Web Mining will also be helpful.
CK-03: Developing an R or Python package for sentiment analysis
A new sentiment lexicon has been constructed, called WKWSCI Sentiment Lexicon. The objective of the project is to develop an R or Python package containing the lexicon, with functions to apply the sentiment lexicon to various text corpora available in R/Python. The project will also compare the effectiveness of the new sentiment lexicon with other available lexicons.
Prerequisite: Familiarity with R or Python. Programming experience.

CK-04: Web application to integrate a knowledge management system with a document management system, using React.js Javascript library
Description: Many organisations are faced with the problem of incorporating an effective knowledge management/taxonomy system in an existing document management/portal system (often implemented in Sharepoint). The objective of this project is to develop a solution that integrates a knowledge management and a document management system at the level of the Web browser, using a Javascript library (i.e. React.js). The first part of the project is to develop a simple Web database application (using Maria.DB and PHP) that accepts a tag (keyword) as input and retrieves matching records in a "taxonomy" database, together with associated broader and narrower terms. The retrieved records are displayed as tree structures showing broader and narrower terms.

The second part of the project (actually the focus of the project) is to integrate this function with an existing document management system. The Web interface that integrates both systems is envisaged to have 2 windows: the main window displaying the document management system, and the right window displaying the knowledge management system. When a new document is uploaded to the document management system, a metadata entry screen is displayed in the main window, including tag fields and taxonomy fields. When the user enters a keyword in a tag field, the interface will submit the keyword to the taxonomy system in the right window, which will then display a tree structure of broader and narrow terms retrieved from the taxonomy database. The user can then select the appropriate broader or narrower term, which the interface will then transfer back to the taxonomy field in the main window.

Requirements: IT background and experience in Web database applications or React.js javascript library.

DG-01: Investigating mobile augmented reality perceptions and behaviors
This project investigates perceptions and behaviors of contemporary mobile games, focusing especially on Pokemon Go, a relatively successful augmented reality game. Groups will examine one of more of the following non-exhaustive phenomena: Motivations for playing mobile games; Reasons for cessation of gameplay; Factors contributing to enjoyment; Positive and negative behaviors arising from gameplay. Depending on the nature of the study, surveys, interviews, focus groups and observations will be employed.

DG-02: Evaluating a mobile crowdsourcing platform for reporting missing persons
This project is a research collaboration with large enterprise software corporation.

The project focuses on a mobile crowdsourced social surveillance platform. By combining crowd intelligence with machine learning, the platform creates an effective social platform for anyone to report potential missing persons. Its machine learning function not only provides instant matching to user-submitted photos, but also creates a self-reinforcing learning loop to continuously refine matching accuracy through close integration with popular social media platforms.

The goal of this project is to evaluate the perceived usefulness and usability of the prototype. CI groups will develop an evaluation framework that centers on user experience by incorporating usefulness and usability constructs that are appropriate to the mobile crowdsourcing platform.
Thereafter, they will conduct user studies of the platform, from which design changes will be recommended.

**DG-03: An analysis of user-generated contributions in human computation games**

In Human Computation Games (HCGs), users contribute their brain power to a given endeavor through enjoyable gameplay. In the context of a HCG for sharing location-based content, what is unknown is the type of content created and its quality. This project will employ content analysis to understand the attributes of user-generated contributions in HCGs. This includes type, quantity, quality and other aspects. A dataset of content that was previously created will be made available for analysis.

**DG-04: Techniques for teaching coding to children**

In recent years, there is an increased focus in teaching coding skills to children. Many innovative techniques have been used including visual programming languages, tangible computing and robotics. However, it is unclear whether these techniques have been effective in imparting coding skills or cultivating interest in coding. The goal of the project is to survey the available offerings by examining either products in the market, products in research and/or the research literature.

**DG-05: A study of online scams, spam and other threats**

This project investigates scams, spam, phishing, fake news and other online threats. These issues are important as people become more dependent on various online services. Major topics include types of online threats encountered, why people fall prey to different types of scams, and motivations for spreading fake news/rumors.

**JP-01: Artificial Intelligence to solve Cyber Security Challenge Problem**

There are numerous Cyber Security competitions with challenge problems held yearly. This project explores how Artificial Intelligence could be used to solve such problems. The CI group will identify one Cyber Security challenge problem and apply Artificial Intelligence algorithm(s) to solve that problem. Programming and knowledge of machine learning or artificial intelligence algorithms will be a prerequisite.

**JP-02: Artificial Intelligence for Dementia Caregivers**

Caring for Dementia patients is a highly involved task requiring constant attention and special care. This project explores how advances in Artificial Intelligence may be applied to such tasks. Programming and knowledge of machine learning or artificial intelligence algorithms will be a prerequisite.

**JS-01: Perception and use of libraries**

Nowadays, individuals often turn to sources beyond libraries for their information needs. This project aims to study the perception and use of libraries by a specific group (e.g., adolescents, parents, etc.). Researchers may also focus on a particular type of library (e.g., public, school, or academic libraries). The goal is to identify how libraries can improve and promote their services. The study may examine: How do individuals perceive and use libraries and other sources such as social media platforms? What library services are most valuable to the user group? What services do users want the library to provide or enhance? What are the demographic, cognitive, affective and contextual factors that contribute to use or non-use?

**JS-02: Everyday life information behaviour**

The advent of social media and mobile communication has led to an explosion of information being disseminated through many channels. How do individuals stay informed about daily happenings and topics of interest to them? Researchers may focus on a specific demographic group and investigate some of the following areas: Everyday information needs and information barriers; information behaviour on social media; information overload; credibility assessment; or factors affecting users’ everyday life information behaviour.
**JS-03: Information inequality: Status, effects, and remedies**
Recent technological development has not mitigated the unequal access and use of information resources among different user groups. It may even have exacerbated the digital and information divide. In this project, researchers may study specific demographic groups, types and channels of information (e.g., health information, printed materials, the Internet), and geographic scopes. The study may focus on: mapping and charting the status and changes in information inequality; identifying the factors that contribute to unequal access and usage; examining the effects of information inequality on different groups; or exploring practices and policies that address information gaps.

**JS-04: Trending topics in Library and Information Science**
Research in Library and Information Science (LIS) plays an important role in informing the effective provision of up-to-date library and information services. This topic explores the subjects and issues central to LIS and its subfields. The research may focus on: longitudinal changes in topics discussed in Singapore and worldwide; changing usage of theories and methods in LIS research; and differences in topics covered by scholarly publications and informal channels such as social media.

**LCK-01: Creation of a Map-based Business Directory**
This project aims to build a map-based business directory using Django/GeoDjango for Singapore businesses. The categories of businesses that are to appear on the map are:
- supermarkets (e.g., NTUC Fairprice and U-Stars Supermarkets)
- convenience stores (e.g., 7-Eleven and Cheers)
- petrol stations
- wet-markets

The focus of the project will be on building the platform, not on the data entry. Students keen on taking up this project are expected to already be familiar with, or be willing to learn the following:
- Django ([https://www.djangoproject.com/](https://www.djangoproject.com/))
- Leaflet.js ([https://leafletjs.com/](https://leafletjs.com/))
- OpenStreetMap ([https://www.openstreetmap.org/](https://www.openstreetmap.org/))

**LCK-02: Creation of a Map-based Guide to Singapore Educational Institutions**
This project aims to build a map-based guide to educational institutions in Singapore using Django/GeoDjango. The categories of educational institutions that are to appear on the map are:
- primary and secondary schools
- junior colleges
- polytechnics
- universities

The focus of the project will be on building the platform, not on the data entry. Students keen on taking up this project are expected to already be familiar with, or be willing to learn the following:
- Django ([https://www.djangoproject.com/](https://www.djangoproject.com/))
- Leaflet.js ([https://leafletjs.com/](https://leafletjs.com/))
- OpenStreetMap ([https://www.openstreetmap.org/](https://www.openstreetmap.org/))
LCS-01: Social Media for Teaching and Learning
This project examines the use of social and mobile communication media for teaching and learning. Educators are increasingly interested in the social tools available to facilitate engagement and encourage learning. What trends are emerging for teaching and learning? What are the motivations driving educators and students to use some tools? What concerns might be keeping educators and students from using them?

LCS-02: Investigating Crowdsourcing
Crowdsourcing is the practice of engaging a 'crowd' or a group for a common goal. Put differently, crowdsourcing relies on the power of the crowd and has the ability to draw from the collective memory, expertise and experience of other people. The project will investigate different crowdsourcing approaches/techniques for play and work.
Examples of projects include: (1) Motivations for participating on a crowdsourcing platform. (2) Incentives and mechanisms (including gaming techniques) to motivate participation on a crowdsourcing platform. (3) Exploring the feasibility of crowdsourcing at work. (4) Developing mobile crowdsourcing applications for different contexts of use. (5) Investigating factors influencing quality of participation on a crowdsourcing platform. Students who are interested to explore crowdsourcing can also propose related projects.

LCS-03: Emerging Social and Mobile Media Applications
This project examines the use of emerging social and mobile media applications under varying workplace contexts.

LCS-04: Understanding Social Computing
Social computing has transformed the way people communicate, share and collaborate online.

Undoubtedly, the accessibility and shared computing resources brought about by social computing applications are having a profound impact on individuals and organizations. Specifically, social computing applications such as wikis (e.g. Wikipedia), blogs (e.g. Blogger), micro-blogging (e.g. Twitter), video-sharing (e.g. YouTube) and social-networking (e.g. MySpace) have attracted communities of like-minded people who forge relationships through content sharing and collaboration.

This project will examine the relationship between the use of social computing applications and individuals differences). Examples of projects may include:
- Effects of individual differences on social computing
- Social Computing in the workplace
- Role of social media in organizational communication
- Social media and libraries

LCS-05: The Future of Work
This is an interdisciplinary research project that examines the challenges and opportunities in the future workplace. New technologies, data analytics and online social networks have huge impacts in the workplace by enabling new ways to communicate and collaborate. Indeed, they have created new industries and business models as well as disrupted some traditional industries. Possible (but not limited to) research areas in this project include: examining job characteristics and hiring practices in the future workplace, investigating the roles played by intelligent technologies in the workplace, studying the changing nature of work in the different industries.
LCS-06: Evaluating a mobile crowdsourcing platform for reporting missing persons
The project introduces a mobile crowdsourced social surveillance platform. By combining crowd intelligence with machine learning, the platform creates an effective social platform for anyone to report potential missing person. Its machine learning function not only provides instant matching to user-submitted photos, but also creates a self-reinforcing learning loop to continuously refine matching accuracy through close integration with popular social media platforms.

The goal of this project is to evaluate the perceived usefulness and usability of the prototype. CI groups will develop an evaluation framework that centers on user experience by incorporating usefulness and usability constructs that are appropriate to the mobile crowdsourcing platform. Thereafter, CI groups will conduct user studies of the platform, from which design changes will be recommended.

LGP-01: Knowledge Co-creation in Academia and Industry Partnership

LGP-02: Societal Impact of Research

LGP-03: Boundary Spanning in Big Data Analytics

LGP-04: Wildlife Conservation Analytics

MSM-01: Factors considered by students for selecting their elective courses
This topic explores the factors considered by students while selecting elective courses such as preference for a particular professor, influence of friends, day and time of classes, work load, future job market, new skills, interesting course title, etc.
MSM-02: Environment scanning activities undertaken by SMEs in Singapore
All companies need to collect up-to-date, accurate and relevant information for problem solving and decision making. This topic investigates business environment scanning activities undertaken by SMEs. Some areas to be investigated are: Information needs, sources used for acquiring the needed information, factors considered for assessing information quality, information processing and sharing, and application of information for various business activities.

MSM-03: Preference and usage of e-books by students
Libraries are using considerable proportions of their budgets on acquiring e-books. The current literature on the use of e-books is inconclusive – some researchers believe e-books are becoming more popular while some other studies suggest preference for print books. The purpose of this project to explore students’ preferred format (print vs electronic) for academic and leisure reading.

MSM-04: Use of social network for seeking health information
Students will investigate if the target population is using social networks for seeking healthcare information; their health-related information needs; frequency of healthcare information seeking; perceptions of the respondents of the quality; and reliability of healthcare information available through social networks.

MSM-05: Use of Patron-Driven Acquisitions (PDA) by libraries for acquiring e-books
PDA is one of the methods for acquiring e-books by libraries. This method provides more flexibility and control to libraries. Not enough data is available that how libraries in Singapore are using this technique to acquire e-books. This topic will explore perceptions and use of this technique by different types of libraries in Singapore, magnitude of the PDA activity, and problem faced by libraries.

MSM-06: Public perception of the role and responsibilities of library and information professionals
Libraries all over the world are changing very fast and, as a result, the roles and responsibilities of library and information science (LIS) professionals are changing. However, many library users don’t adequate appreciate the professional work done by LIS professionals. There are also many stereotypes associated with this profession. This topic will explore opinions and perceptions of the general public of LIS professionals. The findings will be compared with a previous study on this topic by Majid and Haider (2008).

MSM-07: Students’ perception of the importance of soft skills
In addition to professional skills, employers also wish to see certain soft skills in their employees. The CI students can explore if undergraduate/postgraduate students adequately understand the importance of soft skills and make efforts in acquiring these. Alternatively, CI students can survey employers to understand what type of soft skills they would like to see in their new employees.

MSM-08: Use of health apps by different user groups
Several health related apps are easily available which can help smartphone users to regularly monitor their health, nutrition, and physical activities. The purpose of this topic is to explore what types of health apps are used by different segments of the society (teens, young adults, adults, or senior citizens), how frequently they use such apps, what features they like and dislike, and their concerns related to privacy and security issues.
NJC-01: Sentiment Analysis of Social Media Content
Sentiment analysis is a type of subjectivity analysis which analyzes sentiment in a given textual unit with the objective of understanding the sentiment polarities (i.e. positive, negative, or neutral) of the opinions toward various aspects of a subject. The CI group will investigate sentiment analysis of user generated content using machine learning algorithms. Text/Data mining and computer programming skills will be useful for the project.

NJC-02: Altmetrics: Analysis of Tweets Mentioning Research Articles
Altmetrics (short for alternative metrics) intends to assess Web-driven scholarly interactions, such as how often research is tweeted, blogged about, downloaded, or bookmarked. Over the years, Twitter has increasingly been used to disseminate scientific findings to the general public and researchers alike, and how often research articles are tweeted is now a major metric in altmetrics. The aim of this study is to analyze tweets mentioning research articles using machine learning approaches (e.g., motivation analysis of users tweeting research articles, analysis of factors influencing Twitter counts, etc.). It will help to determine whether or not the simple counting of mentions of research papers on Twitter is a meaningful and strong indicator upon which to draw conclusions about research or societal impact in Altmetrics. Text/Data mining and computer programming skills will be useful for the project.

TYL-01: Analysis of Twitter Gaming
Altmetrics can be described as new or alternative metrics based on activities on social media for measuring scholarly impact. In contrast to citation counts, altmetrics reflect impact faster, as a tweet could appear within hours of a paper being published. Altmetrics however face some challenges as they are very susceptible to manipulation and gaming. For example, automated Twitter bot accounts could cause a lot of spam. Thus, to ensure data integrity, it would be useful to understand how researchers could potentially game the system (e.g. retweeting of posts) and what strategies could be implemented to mitigate this.

- Collection of Twitter data.
- Preparation and cleaning of Twitter data ready for analysis.
- An in-depth analysis of Twitter data.
- Determine how researchers could potentially game the system.
- Suggest strategies to mitigate gaming of altmetrics.

TYL-02: Trend Analysis of Altmetrics and Bibliometrics
Altmetrics can be described as new or alternative metrics based on activities on social media for measuring scholarly impact. Different altmetric systems exist that offer dashboards and tools for viewing bibliometrics and altmetrics, but very few focus on offering cross-metric validation between traditional metrics and altmetrics for the “hard sciences” disciplines, and the “non-hard sciences” disciplines, providing visualizations to compare metrics in a time series for individual researchers as well as at aggregated levels.

- Perform trend analysis of data (already) collected over the last 3 - 4 months.
- Visualize the data.
- Determine whether the usage of altmetrics would better quantify research impact compared to using bibliometric measurements.
- Build some machine learning models to predict bibliometrics based on altmetrics.
Existing studies on altmetrics focus mainly on academic research outputs. Some studies consider disciplinary differences but have not delved into innovation and commercialization. In this study, the aim is to investigate top innovators engaged in downstream work and academics known for their creative works and industrial innovations.

- Examine the profile of academics who are also known for their creative works or industrial innovations.
- Document how the achievements of such innovators can be tracked.
- Investigate and propose a list of research objects and altmetrics for research work and outputs resulting in innovation and commercialisation.
- Where possible, conduct interviews of academic innovators.