RGC Ref. No.:
UGC/FDS11/E06/14
(please insert ref. above)

RESEARCH GRANTS COUNCIL
COMPETITIVE RESEARCH FUNDING SCHEMES FOR
THE LOCAL SELF-FINANCING DEGREE SECTOR

FACULTY DEVELOPMENT SCHEME (FDS)

Completion Report
(for completed projects only)

Submission Deadlines:
1. *Auditor's report with unspent balance, if any: within **six** months of the approved project completion date.*
2. *Completion report: within **12** months of the approved project completion date.*

Part A: The Project and Investigator(s)

1. Project Title

Context-aware learner profiling for e-learning system: classization, groupization and Personalization

2. Investigator(s) And Academic Department(s) / Unit(s) Involved

Research Team	Name / Post	Unit / Department / Institution
Principal Investigator	Prof. WANG Fu Lee / Vice-President (Research and Advancement) and Professor	Office of President and School of Computing and Information Sciences, Caritas Institute of Higher Education
Co-Investigator(s)	Prof. LI Qing / Professor	Department of Computer Science, City University of Hong Kong
Others		

3. Project Duration

	Original	Revised	Date of RGC / Institution Approval *(must be quoted)*
Project Start Date	1 December 2014		
Project Completion Date	31 May 2017	31 October 2017	12 April 2017
Duration *(in month)*	30 months	35 months	12 April 2017
Deadline for Submission of Completion Report	31 May 2018	31 December 2017	12 April 2017

Part B: The Final Report

5. Project Objectives

5.1 Objectives as per original application

1. *Develop a unified graph-based approach to assemble multiple hidden relations (e.g., pre-requisite relations, content relations and social relations) so as to identify the potential learner preferences and intentions.*
2. *Devise a mechanism to enrich the learner profile so that the sparsity problem of inactive (or new) learners can be relieved and a more powerful profiling model can be constructed.*
3. *Design an explicit and unified learning context model to describe and formalize various learner contexts in three layers, which are personal-level, group-level and class-level learning contexts respectively.*
4. *Define a set of operations on user profile by giving a specific context so that context-aware learning services are facilitated.*
5. *Apply the above methods and models to e-learning systems by developing and testing functions like personalized courseware recommendation, group member discovery, and class content pruning (or augmenting).*

5.2 Revised objectives

Date of approval from the RGC: N.A.

Reasons for the change:

1.

2.

3. ....

5.3 Realisation of the objectives
(Maximum 1 page; please state how and to what extent the project objectives have been achieved; give reasons for under-achievements and outline attempts to overcome problems, if any)

For Objective 1 “Develop a unified graph-based approach to assemble multiple hidden relations (e.g., pre-requisite relations, content relations and social relations) so as to identify the potential learner preferences and intentions”, we have conducted the following research activities:

- The algorithms for identifying multiple hidden relations have been studied. For example, clustering algorithms such as the minimum spanning tree and density-based clustering and summarization algorithms [J01, J07, C11, C12, C22, C23];
- Social relations among users/learners has been investigated from the social data [J02, C10, C17];
- Pre-requisite relations between knowledge units are investigated in the context of language learning [J01, J04, J13, C13]; and
- Content relations are studied through several text-based and sentiment-based methods [J01, C02, C03, C25].
- Metrics and solutions for the unified graph-based approach have been proposed to assemble multiple relations [J15].

For Objective 2 “Devise a mechanism to enrich the learner profile so that the sparsity problem of inactive (or new) learners can be relieved and a more powerful profiling model can be constructed”, we have conducted the following research activities

- The factors of a more powerful profiling model have been studied [J02, J03, C24, C29];
- The metrics to evaluate the accuracy of the learner profile have been examined [C06, C07, C30]; and
- A mechanism to enrich learner profile from heterogeneous sources has been proposed and studied [J02, J03, J06, J09, C06, C07].
- Relevant techniques have been developed to enrich the learner profile in order to tackle the sparsity problem [J05, C17, C27, C28].

For Objective 3 “Design an explicit and unified learning context model to describe and formalize various learner contexts in three layers, which are personal-level, group-level and class-level learning contexts respectively”, we have conducted the following research activities

- The contextual factors to be included in unified contextual model has been studied [J04, C01, C04, C14]; and
- The learner behaviors and patterns in different levels of learning contexts have been identified in some domain-specific scenarios [C05, C08, C09, C26].
- A unified context model at personal-level, group-level and class-level have been proposed and formalized [J13, C18].

For Objective 4 “Define a set of operations on user profile by giving a specific context so that context-aware learning services are facilitated”, we have conducted the following research activities

- A number of data mining algorithms have been developed to support the operations of user profile and contexts, for example, clustering, classification, frequent pattern mining, parent-child rules generation, etc. [J08, J12, C16].
- A set of operations on user profile and contexts have been defined [C15, C19].

For Objective 5 “Apply the above methods and models to e-learning systems by developing and testing functions like personalized courseware recommendation, group member discovery, and class content pruning (or augmenting)”, we have conducted the following research activities

- A survey of institutional level e-learning systems has been conducted [C21].
- Subsequently, e-learning systems have been developed at individual, group and class levels.
    - Techniques have been developed to support personalized courseware (resource) recommendation [J10, J14, C14, C30].
    - Group member discovery technique have been developed [J07, J11, C04].
    - Class content pruning (or augmentation) [J11, C20].

5.4 Summary of objectives addressed to date

Objectives *(as per 5.1/5.2 above)*	**Addressed** *(please tick)*	**Percentage Achieved** *(please estimate)*
1. Develop a unified graph-based approach to assemble multiple hidden relations (e.g., pre-requisite relations, content relations and social relations) so as to identify the potential learner preferences and intentions.	✓	100%
2. Devise a mechanism to enrich the learner profile so that the sparsity problem of inactive (or new) learners can be relieved and a more powerful profiling model can be constructed.	✓	100%
3. Design an explicit and unified learning context model to describe and formalize various learner contexts in three layers, which are personal-level, group-level and class-level learning contexts respectively.	✓	100%
4. Define a set of operations on user profile by giving a specific context so that context-aware learning services are facilitated.	✓	100%
5. Apply the above methods and models to e-learning systems by developing and testing functions like personalized courseware recommendation, group member discovery, and class content pruning (or augmenting).	✓	100%

6. Research Outcome

6.1 Major findings and research outcome
(Maximum 1 page; please make reference to Part C where necessary)

Five tasks have been completed in this project:

1) A unified framework has been devised based on 'augmented hybrid graph' (AHG) to integrate multiple information sources and their diverse relationships including social relations, pre-requisite relations and content relations. The major findings and research outcomes can be categorized in the following two aspects [J01, J07, C02, C03, C10, C11, C12, C13, C17, C22, C23, C25]:
   (a) The proposed AHG-based framework can be more powerful and flexible if more information sources and their relationships are integrated;
   (b) If training data is sufficient, the proposed AHG-based framework can be adaptive and have a stable performance in various domain-specific applications such as e-learning, stock prediction, text mining and so on.

2) A learner profiling enrichment mechanism has been devised based on the AHG and aforementioned relations to address the insufficient data problem for the learner profiling. The major findings and research outcomes can be categorized in the following two aspects [J02, J03, J05, J06, J09, J15, C06, C07, C24, C27, C28, C29]:
   (a) The proposed mechanism of learner profile enrichment improves the effectiveness and accuracy of personalization in the e-learning systems;
   (b) The proposed mechanism can relieve the data sparsity issue in the construction of learner profiles the e-learning systems;

3) An explicit learning context model has been designed to formally depict different learning scenarios of learner at three different layers, which are personal-level, group-level and class-level learning contexts respectively. The major findings and research outcomes can be categorized in the following two aspects [J04, J13, C01, C04, C05, C08, C09, C18, C26]:
   (a) The defined learning context models are able to describe the various factors and scenarios of learner with the e-learning systems;
   (b) The defined learning context models can be easily integrated in e-learning systems for various disciplines like language learning or computer sciences.

4) A set of operations has been defined to manipulate the enriched learner profile with contexts to facilitate context-awareness. The major findings and research outcomes can be categorized in the following two aspects [J08, J12, C15, C16, C19]:
   (a) The defined operation set for context models and enriched learner profiles provide more flexibility in personalization and context-awareness in e-learning systems;
   (b) The defined operation set can be generalized in analyzing data from context-aware systems in various domains like on-line news, telecom alarming messages and e-learning.

5) The obtained learner profiles and contexts have been applied to support a suite of e-learning applications at personal, group and class levels. The major findings and research outcomes can be categorized in the following three aspects [J10, J11, J14, C14, C20, C21, C30]:
   (a) E-learning applications at personalized level can achieve better performance when the integration of the individual learner profile and context are adopted;
   (b) E-learning applications at group level can achieve better performance when the consolidated profile of each group member and group contexts is adopted;
   (c) E-learning applications at class level can achieve better performance when the consolidated profile of groups and class contexts are adopted.

6.2 Potential for further development of the research and the proposed course of action *(Maximum half a page)*

Techniques for automatic recommendation have been investigated in the project [J14, C14, C30]. In order to assist a learner to find relevant learning resources effectively and efficiently from a large volume of learning data, it is very important to make use of feedback of other learners [J10, C01]. As a result, we have started our research on sentiment analysis which aims to extract sentiment-related information from text automatically. For example, we investigated sentiment classification model [C02, C16, C25]. Moreover, we have demonstrated how to incorporate sentiment inti user profile model [J06]. Due to the volume of learning data and user feedback, automatic sentiment detection technique is urgently required. Some preliminary studies have been conducted [C03, C27]. Most sentiment analysis is concerned with the detection of opinions from reviews. There is increasing interest in the affective dimension of the social network. However, analysing social network data using traditional sentiment analysis methods is problematic for several reasons. As a result, more advanced technique is required. Another Project "Sentiment Analysis based on Multi-source Social Network Data" (Project No.: UGC/FDS11/E03/16) funded by RGC under Faculty Development Scheme will address these issues.

The first issue is the preprocess of short text which is prevalent in social networks. The second issue is how to deal with noisy labels. Due to the fact that it is hard to control the authenticity and quality on the social network, spotting potentially malicious users and detecting noisy labels are critical to sentiment analysis. The third issue is that emotion perception is very personal and could vary from one person to another, that is, different users may have different attentions, perspectives or abilities when labeling documents emotionally. Thus, sentiment analysis is not only text-related but also user-dependent. The fourth issue is that the sentiment embedded in social networks often has intrinsic dynamics. Capturing such dynamic characteristics of sentiments is critically important for the successful development of various social services, such as public opinion monitoring and social event detection. Last but not the least, the application of sentiment analysis in recommendation systems, stock price prediction and other domains deserves further research.

7. Layman's Summary

(Describe <u>in layman's language</u> the nature, significance and value of the research project, in no more than 200 words)

The rapid developments of online learning, Massive Online Open Course (MOOC), and social media, on one hand, bring more fruitful learning resources and human interactions. Yet on the other hand, they make more difficult for learners to find their desired learning resources effectively and efficiently when confronting with such a large volume of learning data. To assist learners to find their desired learning materials and suitable courses, it is essential to manage and organize information about learners as well as various learning resources. In this project, we have developed a hybrid profiling approach to aggregate the multiple hidden relations, such as pre-requisite relations, content relations and social relations, so as to enrich the learner profile with valuable information from his/her neighbors or some potential interested learning resources. Furthermore, we have devised an explicit context model to fully exploit the value of learner profile so that the problem of static learner profile can be resolved and context-aware learning services and applications can be supported. Specifically, contexts are classified into three different layers, which are personal-level, group-level and class-level learning contexts. Each layer may have different effects on the learner profile. Subsequently, e-learning applications have been developed in three different layers.

Part C: Research Output

8. Peer-Reviewed Journal Publication(s) Arising Directly From This Research Project

(Please attach a copy of the publication and/or the letter of acceptance if not yet submitted in the previous progress report(s). All listed publications must acknowledge RGC's funding support by quoting the specific grant reference.)

The Latest Status of Publications				**Author(s)** *(denote the corresponding author with an asterisk*)*	**Title and Journal / Book** *(with the volume, pages and other necessary publishing details specified)*	**Submitted to RGC** *(indicate the year ending of the relevant progress report)*	**Attached to this Report** *(Yes or No)*	**Acknowl-edged the Support of RGC** *(Yes or No)*	**Accessible from the institutional repository** *(Yes or No)*
Year of Publication	**Year of Acceptance** *(For paper accepted but not yet published)*	**Under Review**	**Under Preparation** *(optional)*						
2015				Xiaodong Li, Haoran Xie, Yi Cai*, Ho-fung Leung, **Qing Li**, Huaqing Min, **Fu Lee Wang**	**[J01]** Does summarization help stock prediction? news impact analysis via summarization, ***IEEE Intelligent Systems***, 30(3): 26-34, 2015	2015	No	Yes	Yes
2016				Haoran Xie, Di Zou* Raymond Y.K. Lau, **Fu Lee Wang**, Tak-Lam Wong	**[J02]** Generating incidental word-learning tasks via topic-based and load-based profiles, ***IEEE Multimedia***, 23(1):60-70.		Yes	Yes	Yes
2016				Qing Du, Haoran Xie, Yi Cai*, Ho-fung Leung, **Qing Li**, Huaqing Min, **Fu Lee Wang**	**[J03]** Folksonomy-based personalized search by hybrid user profiles in multiple levels, ***Neurocomputing***, 204: 142-152.		Yes	Yes	Yes
2016				Yi Cai, Wen-Hao Chen, Ho-fung Leung, **Qing Li**, Haoran Xie*, Raymond Y.K. Lau, Huaqing Min, **Fu Lee Wang**	**[J04]** Context-aware ontologies generation with basic level concepts from collaborative tags, ***Neurocomputing***, 208: 25-38.		Yes	Yes	Yes

The Latest Status of Publications				Author(s) *(denote the corresponding author with an asterisk*)*	Title and Journal / Book *(with the volume, pages and other necessary publishing details specified)*	Submitted to RGC *(indicate the year ending of the relevant progress report)*	Attached to this Report *(Yes or No)*	Acknowl-edged the Support of RGC *(Yes or No)*	Accessible from the institutional repository *(Yes or No)*
Year of Publication	**Year of Acceptance** *(For paper accepted but not yet published)*	**Under Review**	**Under Preparation** *(optional)*						
2016				Yanghui Rao, Haoran Xie*, Jun Li, Fengmei Jin, **Fu Lee Wang**, **Qing Li**	**[J05]** Social emotion classification of short text via topic-level maximum entropy model, ***Information & Management***, 53: 978-986.		Yes	Yes	Yes
2016				**Haoran Xie**, Xiaodong Li*, Tao Wang, Raymond Y.K. Lau, Tak-Lam Wong, Li Chen, **Fu Lee Wang**, **Qing Li**	**[J06]** Incorporating sentiment into tag-based user profiles and resource profiles for personalized search in folksonomy, ***Information Processing and Management***, 52: 61-72.		Yes	Yes	Yes
2016				Qingyuan Wu, Changchen Zhan, **Fu Lee Wang *,** Siyang Wang, Zeping Tang	**[J07]** Clustering of Online Learning Resources via Minimum Spanning Tree, ***Asian Association of Open Universities Journal***. 11(2):197-215		Yes	Yes	Yes
2017				Jiantao Wang, Caifeng He, Yijun Liu, Guangjian Tian, Ivy Peng, Jia Xing, Xiangbing Ruan, Haoran Xie*, **Fu Lee Wang**	**[J08]** Efficient alarm behavior analytics for telecom networks, ***Information Sciences***, 402: 1-14.		Yes	Yes	Yes

The Latest Status of Publications				Author(s) *(denote the corresponding author with an asterisk*)*	Title and Journal / Book *(with the volume, pages and other necessary publishing details specified)*	Submitted to RGC *(indicate the year ending of the relevant progress report)*	Attached to this Report *(Yes or No)*	Acknowl-edged the Support of RGC *(Yes or No)*	Accessible from the institutional repository *(Yes or No)*
Year of Publication	**Year of Acceptance** *(For paper accepted but not yet published)*	**Under Review**	**Under Preparation** *(optional)*						
2016				Yanghui Rao, Haoran Xie∗, Xuebo Liu, **Qing Li**, **Fu Lee Wang**, Tak-Lam Wong	**[J09]** User authority ranking models for community question answering, ***Journal of Intelligent and Fuzzy Systems***, 31(5): 2533-2542		Yes	Yes	Yes
2016				Haoran Xie, Debby D. Wang, Yanghui Rao*, Tak-Lam Wong, Lau Y. K. Raymond, Li Chen, **Fu Lee Wang**	**[J10]** Incorporating user experience into critiquing-based recommender systems: a collaborative approach based on compound critiquing, ***International Journal of Machine Learning and Cybernetics,*** DOI: 10.1007/s13042-016-0611-2		Yes	Yes	Yes
2017				Haoran Xie, Di Zou, **Fu Lee Wang**, Tak-Lam Wong, Yanghui Rao*, Simon Ho Wang	**[J11]** Discover learning path for group users: A profile-based approach, ***Neurocomputing***, 254, 59-70		Yes	Yes	Yes
2017				Yanghui Rao, **Qing Li**, Qingyuan Wu, Haoran Xie*, **Fu Lee Wang**, Tao Wang	**[J12]** A multi-relational term scheme for first story detection, ***Neurocomputing***, 254,42-52		Yes	Yes	Yes

The Latest Status of Publications				**Author(s)** *(denote the corresponding author with an asterisk*)*	**Title and Journal / Book** *(with the volume, pages and other necessary publishing details specified)*	**Submitted to RGC** *(indicate the year ending of the relevant progress report)*	**Attached to this Report** *(Yes or No)*	**Acknowl-edged the Support of RGC** *(Yes or No)*	**Accessible from the institutional repository** *(Yes or No)*
Year of Publication	**Year of Acceptance** *(For paper accepted but not yet published)*	**Under Review**	**Under Preparation** *(optional)*						
2017				Di Zou*, Haoran Xie, Yanghui Rao, Tak-Lam Wong, **Fu Lee Wang**, Qingyuan Wu	**[J13]** A comparative study on various vocabulary knowledge scales for predicting vocabulary pre-knowledge, ***International Journal of Distance Education Technologies***, 15(1), 69-81		Yes	Yes	Yes
2018				Haoran Xie, Di Zou, Tak-Lam Wong*, **Fu Lee Wang**	**[J14]** Modelling second language learners for learning task recommendation, ***International Journal of Innovation and Learning,*** 23(1), 76-92		Yes	Yes	Yes
2017				Tak-Lam Wong*, Haoran Xie, Wai Lam, **Fu Lee Wang**	**[J15]** A learning framework for information block search based on probabilistic graphical models and Fisher Kernel, ***International Journal of Machine Learning and Cybernetics***, DOI 10.1007/s13042-017-0657-9		Yes	Yes	Yes

9. Recognized International Conference(s) In Which Paper(s) Related To This Research Project Was / Were Delivered
(Please attach a copy of each conference abstract)

Month / Year / Place	**Title**	**Conference Name**	**Submitted to RGC** *(indicate the year ending of the relevant progress report)*	**Attached to this Report** *(Yes or No)*	**Acknowledged the Support of RGC** *(Yes or No)*	**Accessible from the institutional repository** *(Yes or No)*
01/ 2015/ Hong Kong	**[C01]** Integrating various feedback approaches into inferencing for second language vocabulary acquisition	The 11th International Conference on Technology Education in the Asia Pacific Region (ICTEAP 2015)	2015	No	Yes	Yes
04/ 2015/ Hanoi, Vietnam	**[C02]** Intensive maximum entropy model for sentiment classification of short text	The 19th International Conference on Database Systems for Advanced Applications (DAFSAA 2015)	2015	No	Yes	Yes
04/ 2015/ Hanoi, Vietnam	**[C03]** Sentiment detection of short text via probabilistic topic modeling	The 19th International Conference on Database Systems for Advanced Applications (DAFSAA 2015)	2015	No	Yes	Yes
[C04] 06/ 2015/ Gothenburg, Sweden	**[C04]** Computer-supported collaborative word acquisition for language learner	The 11th International Conference on Computer Supported Collaborative Learning (CSCL 2015)	2015	No	Yes	Yes
06/ 2015/ Hong Kong	**[C05]** Comparing monolingual mobile dictionaries and paper dictionaries in the context of reading among Cantonese EFL learners in Hong Kong	The 9th International Conference on Asia Association for Lexicography (ASIALEX 2015)	2015	No	Yes	Yes
07/ 2015/ Hong Kong	**[C06]** Evaluating the profile accuracy for second language learners	The 2nd International Conference on Technology in Education (ICTE 2015)	2015	No	Yes	Yes
07/ 2015/ Hong Kong	**[C07]** Comparative study on heterogeneous profiling sources for second language learners	The 2nd International Conference on Technology in Education (ICTE 2015)	2015	No	Yes	Yes

Month / Year / Place	**Title**	**Conference Name**	**Submitted to RGC** *(indicate the year ending of the relevant progress report)*	**Attached to this Report** *(Yes or No)*	**Acknowledged the Support of RGC** *(Yes or No)*	**Accessible from the institutional repository** *(Yes or No)*
07/ 2015/ Wuhan, China	**[C08]** Investigating the effectiveness of the uses of electronic and paper-based dictionaries in promoting incidental word learning	The 8th International Conference on Hybrid Learning (ICHL 2015)	2015	No	Yes	Yes
08/ 2015/ Padova, Italy	**[C09]** The use of monolingual mobile dictionaries in the context of reading by intermediate Cantonese EFL learners in Hong Kong	The 22nd International Conference on European Association for Computer-Assisted Language Learning (EUROCALL 2015)	2015	No	Yes	Yes
11/ 2015/ Guangzhou, China	**[C10]** Social network application development based on cloud computing for web-based learning	The 14th International Conference on Web-based Learning Workshops (ICWL 2015)	2015	No	Yes	Yes
11/ 2015/ Guangzhou, China	**[C11]** A density-based clustering algorithm with educational applications	The 14th International Conference on Web-based Learning Workshops (ICWL 2015)	2015	No	Yes	Yes
11/ 2015/ Guangzhou, China	**[C12]** A clustering algorithm based on minimum spanning tree with e-learning applications	The 14th International Conference on Web-based Learning Workshops (ICWL 2015)	2015	No	Yes	Yes
11/ 2015/ Guangzhou, China	**[C13]** Predicting pre-knowledge on vocabulary from e-learning assignments for language learners	The 14th International Conference on Web-based Learning (ICWL 2015)	2015	No	Yes	Yes
12/ 2015/ Hangzhou, China	**[C14]** Identifying Context Familiarity for Incidental Word Learning Task Recommendations	The 23rd International Conference on Computers in Education (ICCE 2015)		Yes	Yes	Yes
12/ 2015/ Hangzhou, China	**[C15]** Context-aware Personalized Courses Search based on Hybrid Learner Profile	The 23rd International Conference on Computers in Education (ICCE 2015)		Yes	Yes	Yes

Month / Year / Place	**Title**	**Conference Name**	**Submitted to RGC** *(indicate the year ending of the relevant progress report)*	**Attached to this Report** *(Yes or No)*	**Acknowledged the Support of RGC** *(Yes or No)*	**Accessible from the institutional repository** *(Yes or No)*
1/ 2016/ Hong Kong	**[C16]** Weighted Multi-label Classification Model for Sentiment Analysis of Online News	The 2016 International Conference on Big Data and Smart Computing (BigComp 2016)		Yes	Yes	Yes
4/ 2016/ Dallas, USA	**[C17]** SBTM: Topic Modeling over Short Texts	The 21st International Conference on Database Systems for Advanced Applications (DASFAA 2016)		Yes	Yes	Yes
5/ 2016/ Hong Kong	**[C18]** A Versatile Learning Context Framework for Heterogeneous E-learning Applications	The 20th Global Chinese Conference on Computers in Education (GCCCE 2016)		Yes	Yes	Yes
7/ 2016 Jeju, Korea	**[C19]** Singular Vector Decomposition based Hybrid Pattern Search – An Efficient Co-Clustering Method	The 2016 International Conference on Machine Learning and Cybernetics (ICMLC 2016)		Yes	Yes	Yes
7/ 2016/ Beijing, China	**[C20]** The Augmented Hybrid Graph Framework for Multi-level E-Learning Applications	International Conference on Blended Learning 2016 (ICBL 2016)		Yes	Yes	Yes
10/ 2016/ Rome, Italy	**[C21]** When Innovation Meets Evolution: An Extensive Study of Emerging e-Learning Technologies for Higher Education in Hong Kong	The First International Symposium on Emerging Technologies for Education (SETE 2016)		Yes	Yes	Yes
10/ 2016/ Rome, Italy	**[C22]** Topic-Level Clustering on Web Resources	The First International Symposium on Emerging Technologies for Education (SETE 2016)		Yes	Yes	Yes
11/ 2016/ Singapore	**[C23]** Biclustering-based Iterative Segmentation of Human Face Images for Facial Feature Extraction	IEEE Region 10 Conference 2016 (TENCON 2016)		Yes	Yes	Yes

Month / Year / Place	**Title**	**Conference Name**	**Submitted to RGC** *(indicate the year ending of the relevant progress report)*	**Attached to this Report** *(Yes or No)*	**Acknowledged the Support of RGC** *(Yes or No)*	**Accessible from the institutional repository** *(Yes or No)*
2/ 2017/ Jeju, Korea	**[C24]** Revisit Tag-based Profiles in The Folksonomy: How Many Tags Are Sufficient For Profiling?	The 2017 International Conference on Big Data and Smart Computing (BigComp 2017)		Yes	Yes	Yes
2/ 2017/ San Francisco, USA	**[C25]** Cross-Domain Sentiment Classification via Topic-Related TrAdaBoost	The Thirty-First AAAI Conference on Artificial Intelligence (AAAI-17)		Yes	Yes	Yes
3/ 2017/ Vancouver, Canada	**[C26]** An Automatic Approach for Discovering Skill Relationship from Learning Data	The 7th International Conference on Learning Analytics & Knowledge (LAK'17)		Yes	Yes	Yes
3/ 2017/ Suzhou, China	**[C27]** Supervised Intensive Topic Models for Emotion Detection over Short Text	The 22nd International Conference on Database Systems for Advanced Applications (DASFAA 2017)		Yes	Yes	Yes
4/ 2017/ Perth, Australia	**[C28]** Sentiment Strength Prediction Using Auxiliary Features	The 26th International World Wide Web Conference 2017 (WWW'17)		Yes	Yes	Yes
6/ 2017/ Toronto, Canada	**[C29]** Audience and Multimodality: Factors with Important Influences on the Effectiveness of E-portfolios	Canada International Conference on Education 2017 (CICE-2017)		Yes	Yes	Yes
9/ 2017/ Cape Town, South Africa	**[C30]** An Explicit Learner Profiling Model for Personalized Word Learning Recommendation	The Second Annual International Symposium on Emerging Technologies for Education (SETE 2017)		Yes	Yes	Yes

10. Whether Research Experience And New Knowledge Has Been Transferred / Has Contributed To Teaching And Learning
(Please elaborate)

The techniques developed in this project has been applied to language training. Particularly, the effectiveness of the techniques has been demonstrated in undergraduate English courses [J13, J14, C06, C07, C09, C13].

11. Student(s) Trained
(Please attach a copy of the title page of the thesis)

Name	Degree Registered for	Date of Registration	Date of Thesis Submission / Graduation
Nil			

12. Other Impact
(e.g. award of patents or prizes, collaboration with other research institutions, technology transfer, teaching enhancement, etc.)

(a) We have established the research collaborations with many non-local and local universities (e.g., The Chinese University of Hong Kong, City University of Hong Kong, The Hong Kong Polytechnic University, The Education University of Hong Kong, South China University of Technology, Sun Yat-sen University, Shenzhen University and Beijing Normal University).
(b) Our paper entitled “Sentiment Detection of Short Text via Probabilistic Topic Modeling” has received the best paper award by the 2nd International Workshop on Semantic Computing and Personalization.
(c) Our paper entitled “The Augmented Hybrid Graph Framework for Multi-level E-Learning Applications” has received the excellent paper award by the International Conference on Blended Learning 2016.
(d) Our paper entitled “Supervised Intensive Topic Models for Emotion Detection over Short Text” has received the best paper award (runner-up) by the 22nd International Conference on Database Systems for Advanced Applications.

13. Public Access Of Completion Report
(Please specify the information, if any, that cannot be provided for public access and give the reasons.)

Information that Cannot Be Provided for Public Access	Reasons
Nil	

RESEARCH GRANTS COUNCIL
COMPETITIVE RESEARCH FUNDING SCHEMES FOR THE LOCAL SELF-FINANCING DEGREE SECTOR

FACULTY DEVELOPMENT SCHEME (FDS)

Completion Report - Attachment
(for completed projects only)

RGC Ref. No.:	UGC/FDS/E06/14
Principal Investigator:	WANG Fu Lee
Project Title:	Context-aware learner profiling for e-learning system: classization, groupization and Personalization

Statistics on Research Outputs

	Peer-reviewed Journal Publications	Conference Papers	Scholarly Books, Monographs and Chapters	Patents Awarded	Other Research Outputs (Please specify)
No. of outputs arising directly from this research project [or conference]	15	30	0	0	0