

Research Practice & Ethics

COMP9011

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Delivered To

MSc Software Architecture and Design

MSc Artificial Intelligence

MSc Information Design and Development

Your Lecturer: Mubashir Husain Rehmani



Education

- B.Eng (2004) from Mehran UET, Pakistan
- M.S. (2008) from University of Paris Sud XI, France
- Ph.D. (2011) from University Pierre and Marie Curie, France

Professional Experience

- Post-Doctorate (2012) - University Paris Est, France
- Assistant Professor (2012-17) - COMSATS University, Pakistan
- Post-Doctorate (2017-18) - Waterford Institute of Technology, Ireland
- Assistant Lecturer (2019-Present) - Cork Institute of Technology, Ireland

Selected Publications



Books

- 6 books published (Wiley, Springer, CRC Press, IGI Global)

Journal/Magazine Articles

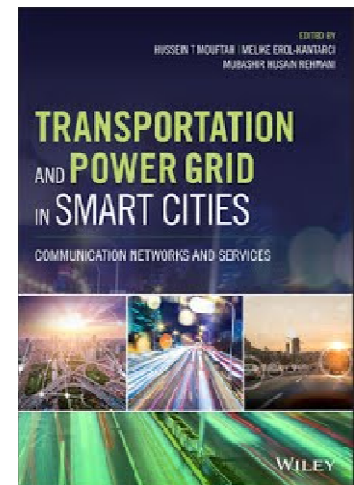
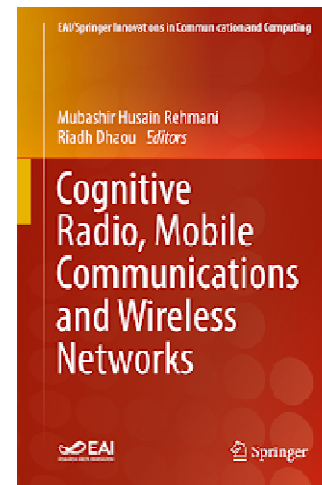
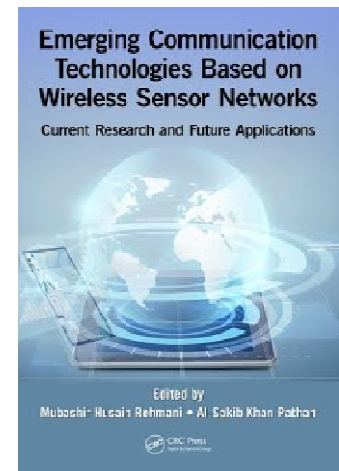
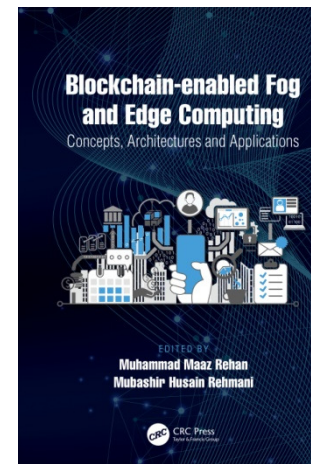
- 90 articles published

International Conferences

- 12 articles published

Book Chapters

- 16 book chapters published



Awards and Recognitions

- **Best Paper Award**
 - from Elsevier Journal of Network and Computer Applications 2018
 - from IEEE Communications Society 2017
 - from Higher Education Commission, Government of Pakistan 2016
- **Exemplary Editor Award**
 - from IEEE Communications Society 2015

Professional Activities

- **Editor/Guest Editor of Several Journals**
 - IEEE Transactions on Green Communications and Networking
 - IEEE Transactions on Industrial Informatics
 - IEEE Communications Magazine
 - IEEE Communications Surveys and Tutorials
 - Elsevier Future Generation Computer Systems
 - Springer Wireless Networks
 - And many others.....

Few Representative Modules Taught in CIT



Fraud and Anomaly Detection

 Use machine learning algorithms to detect fraud and anomaly

Future Internet

 Future Internet and enabling technologies

Data Centre Networking

 Design and operation of data center networks

Distributed Systems Programming

 Java based programming for distributed systems

Distributed Ledger Technology

 Design and working of blockchain technology and its applications

Module Description



- The purpose of this module is to introduce students to the tools and techniques for doing research.
- In addition, students will examine the concept of research integrity and ethics applied to their field of study.
- On completion of this module students will develop a research proposal outlining the context of the topic, its research aims, objectives, methodologies, work plan, ethical considerations etc.
- This proposal will then be developed further in an implementation phase.

Learning Outcomes



On successful completion of this module, the learner will be able to:

LO1	Develop a research proposal defining the project aims, objectives and research methodology that will be applied to the research project.
LO2	Review the current state of the art in the topic related to the proposed research outlining the contribution the research will make to the general field.
LO3	Evaluate the main research integrity and ethical considerations that need to be considered in the proposed project.
LO4	Develop a project schedule and plan that considers the identified research integrity and ethical considerations.
LO5	Communicate effectively the idea and contribution of the proposed research project.

Detailed Course Contents - I



Research Methods and Methodologies	Definitions. Knowledge kinds and interrelationships. Empirical Research. Basic Research. Applied Research. Practical Research. Action Research. Parameters of research. Kinds of research: qualitative, descriptive and experimental. Applying research methodologies to computing, software and software development. Case studies and examples.
Research and Research Strategies	Constitution of research papers. Standards. Search strategies including: web, library, inter-library loan, databases such as IEEE and ACM, search engines. Literature review and systematic literature review.

Detailed Course Contents - II



Research Planning	Issues within a research project that relate specifically to computing/software projects including: problem definition, software planning, specification and system definition, choosing environments for development, timing issues relating to the software process, prototyping, iteration, risk evaluation, slippage, performance issues, evaluations and conclusions.
Research Documentation	Documentation appropriate to research and the programme specifications. This includes research proposal documentation, report documentation, research paper formats and citation formats.

Detailed Course Contents - III



Ethics for Computer Scientists	Ethics in Information & communication technology. Ethics, privacy and information security. Computer Ethics. Cyber ethics. Social, regulation and legal issues. Ethical design. Impact of IoT on ethics - environment monitoring and data collection. Impact of AI on ethics. Posthuman era, machine ethics, unintended consequences. Case studies - Facebook Mood Manipulation Experiments, Internet of Things, Google Maps.
Research Ethics & integrity	Human subjects - ethical, legal, social and political issues. Research ethics committee in CIT. Categories of research ethics - questionnaires/surveys for adults versus children. Consent.

Module Resources



Recommended Book Resources

Martyn Denscombe 2014, *The Good Research Guide*, 5 Ed., Open University Press, McGraw-Hill Education [ISBN: 9780335264704]

Supplementary Book Resources

- Steven J. Taylor, Robert Bogdan, Marjorie DeVault 2016, *Introduction to Qualitative Research Methods: A Guidebook and Resource*, 4 Ed., Wiley [ISBN: 9781118767214]

- Prabhat Pandey, Meenu Mishra Pandey 2015, *Research Methodology: Tools and Techniques*, 1 Ed., Bridge Center [ISBN: 9786069350270]

- James D. Lester 2014, *Writing Research Papers: A Complete Guide*, 15 Ed., Pearson [ISBN: 9780321952950]

- K. Schwalbe 2011, *Information Technology Project Management*, 6 Ed., Cengage Learning [ISBN: 9781111221751]

- Dennis Lock 2007, *Project management*, Gower Aldershot [ISBN: 978-0566087721]

- Nick Bostrom 2016, *Superintelligence: Paths, Dangers, Strategies*, OUP Oxford [ISBN: 9780198739838]

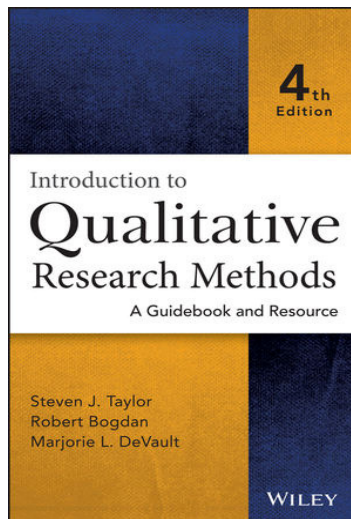
Books



The Good Research Guide, 2014

by Martyn Denscombe

ISBN: 9780335264704 Edition: Fifth



Introduction to Qualitative Research Methods: A Guidebook and Resource

by Steven J. Taylor, Robert Bogdan, Marjorie DeVault

ISBN: 9781118767214 Edition: Fourth

Other Resources - Websites



Websites

Website: **APA reference style: Tightening up you citations.** <http://linguistics.byu.edu/faculty/henrichsen/APA/APA11.html>

Website: Henrichsen, L. et al. 2007, **Taming the Research Beast** <http://linguistics.byu.edu/faculty/henrichsen/ResearchMethods/>

Website: The Atlantic 2014, **Everything We Know About Facebook's Secret Mood Manipulation Experiment** <https://www.theatlantic.com/technology/archive/2014/06/everything-we-know-about-facebooks-secret-mood-manipulation-experiment/373648/>

Website: Berkman Klein Centre for Internet & Society at Harvard University, **Ethics and Governance of Artificial Intelligence** <https://cyber.harvard.edu/research/ai?page=2>

Other Resources – Research Papers



Research Papers

Shaw, M. 2003, ***Writing Good Software Engineering Research Papers***, Proceeding of the 25th International Conference on Software Engineering: IEEE Computer Society, 726-736

Nick Bostrom, Eliezer Yudkowsky 2014, *The Ethics of Artificial Intelligence*, The Cambridge handbook of artificial intelligence, 316-318 <https://intelligence.org/files/EthicsofAI.pdf>

Francine Berman and Vinton G. Cerf 2017, *Social and Ethical Behavior in the Internet of Things*, Communications of the ACM, 60(2) http://www.cs.rpi.edu/~bermaf/Berman+Cerf_IoT.pdf

Assessment



Course Work				
Assessment Type	Assessment Description	Outcome addressed	% of total	Assessment Date
Essay	The student will propose an initial research topic and will define some initial context behind the idea. In addition, the student will define some preliminary research aims and objectives. The student will then be expected to present their idea with the aim of effectively communicating the broad research topic and context.	1,2	40	Week 8
Other	The student will develop the research proposal detailing fully the idea and relevant state of the art, aims, objective, methodologies, work plan schedule and ethical issues that need to be considered. The student may also be required to present their proposal.	1,2,3,4,5	60	Sem End

Note: We will make these assessment one week earlier!

Workload



Course Work			
Workload Type	Workload Description	Hours	Frequency
Lecture	Lecture delivering theory underpinning learning outcomes.	2.0	Every Week
Lab	Practical to develop individual proposal.	1.0	Every Week
Independent Learning (Non-contact)	Independent Study.	4.0	Every Week
Total Hours = 7.0 Every Week			

- Labs** ➔ I will assign you research papers to review to develop your critical thinking
➔ I will assign you small tasks related with research practice and ethics

Acknowledgement



- I have prepared these slides by consulting material from Internet, Wikipedia, different books, Youtube and other researchers course contents. Moreover, I have also consulted previous lecturer's research notes/slides, who delivered this module namely Dr. Donna O'Shea and Dr. Victor Cionca.

Research Project for Semester 2



- MSc Software Architecture and Design
 - Computer Research Project Implementation – COMP9028
 - <https://courses.cit.ie/index.cfm/page/module/moduleId/12856>

- MSc Artificial Intelligence
 - AI Research Project – COMP9068
 - <https://courses.cit.ie/index.cfm/page/module/moduleId/13406>

- MSc Information Design and Development
 - Information Development Research Project – COMP9045
 - <https://courses.cit.ie/index.cfm/page/module/moduleId/12397>

Week 1

Introduction to Module
Scientific Publications & Related Terms
Why Publish Research Papers?

Scientific Publications and Related Terms



- Patent
- Research Paper
 - Published in Journals
 - Magazines
 - Transactions
 - Letters
 - Normal Journals
 - Published in Conferences
 - Published as Posters
 - Published as Technical Reports
- Books
- Book Chapters

Types of Research Paper



- Survey/Review article
- Technical article
- Transactions article
- Magazine article
- Short articles
 - Letters
- Technical reports
- Editorials

Why Publish Research Paper?



To Earn PhD
Degree

To Promote to
Professor

To Attract
Funding

To Recognize
in Scientific
Community

To
Disseminate
Knowledge

To Supervise
PhD/MSc
Students

To Invent
Something

To Research
and Discover