

# Masoud Makrehchi, Ph.D., P.Eng., SMIEEE

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CITIZENSHIP	Canadian Citizen
RESEARCH INTERESTS	Social Computing and Human Computation, Big Data Analytics, Social Media Analytics, Mining and Analysis of Social Networks, Text and Data Mining, Artificial Intelligence and Machine Learning, Recommender Systems
EDUCATION	<b>Ph.D., Electrical and Computer Engineering</b> <i>University of Waterloo, Waterloo, ON, Canada</i> 2007  <b>M.S., Computer Engineering</b> <i>Shiraz University, Shiraz, Iran</i> 1994  <b>B.Sc., Electrical and Computer Engineering</b> <i>Iran University of Science and Technology, Tehran, Iran</i> 1991
LICENSURE	<b>P.Eng</b> <i>Professional Engineers Ontario</i> 2015
GRANTS	<ul style="list-style-type: none"><li>○ NSERC Discovery Grant (five years, \$75,000) 2014-2019</li><li>○ SSHRC Insight Development Grant (Two years, \$74,718) 2014-2015</li><li>○ NSERC Engage (six months, \$24,000) 2014</li></ul>
SCHOLARSHIPS	<ul style="list-style-type: none"><li>○ NSERC Industrial R&amp;D Fellowship (IRDF) award (declined) 2011</li><li>○ NSERC Postgraduate Scholarship (PGS-B) 2003-2004</li><li>○ University of Waterloo President's Graduate Scholarship 2003-2004</li><li>○ Ontario Graduate Scholarship (declined) 2003</li></ul>

- Ontario Graduate Scholarship in Science and Technology Winter 2006
  - University of Waterloo Alumni Scholarship Winter 2006
  - University of Waterloo Graduate Scholarship Winter 2005
  - University of Waterloo Faculty of Engineering Graduate Scholarship Winter 2004
  - University of Waterloo Faculty of Engineering Graduate Scholarship Winter 2003
- HONORS AND AWARDS
- 2012 International Conference on social Computing, Behavioral-Cultural Modeling, and Prediction (SBP) Challenge Award Apr. 2012
  - The 2006 Web Intelligent Conference (WI06/IAT06) Student Travel Award, Hong Kong Nov. 2006
  - The second position award for the best poster at the second annual LORNET Scientific Conference, Vancouver, BC, Canada Nov. 2005
  - The second position award for the best student paper at the North American Fuzzy Information Processing Society (NAFIPS) Annual Conference, Banff, AB, Canada July 2004
  - National Kharazmi Award (joint contribution), the third position for the most innovative project on National Information Infrastructure Strategic Planning, Tehran, Iran Feb. 2002
- ACADEMIC EXPERIENCE
- Associate Professor** July 2012–Present  
*Faculty of Engineering and Applied Science, University of Ontario Institute of Technology, Oshawa, ON, Canada*
- RESEARCH EXPERIENCE
- Consultant** June 2013–Sept. 2013  
*Thomson Reuters, Research and Development, Eagan, MN, USA*  
 Big twitter data clustering for thread detection.
- Senior Research Scientist** Jan. 2012–June 2012  
*Thomson Reuters, Research and Development, Toronto, ON, Canada*  
 Project lead of the following research projects:
- *Stock prediction using event-based sentiment analysis*: We propose a novel approach to label social media text using significant stock market events (big losses or gains). Since stock market events are easily quantifiable using returns from indices or individual stocks, they provide meaningful and automated labels. We extract significant stock movements and collect appropriate pre, post and contemporaneous text from social media sources (for example, tweets from twitter). Subsequently, we assign the respective label (positive or negative) for each tweet. We train a model on this collected set and make predictions for labels of future tweets.

We aggregate the net sentiment per each day (amongst other metrics) and show that it holds significant predictive power for subsequent stock market movement. We create successful trading strategies based on this system and find significant returns over other baseline methods.

- *Classification-based filtering of non-recommendable news in a news recommender system:* In a news recommender system whose main function is to recommend relevant business-related news to the users, a classifier was designed to classify business from non-business news. An elaborate feature engineering using news content and metadata were performed.

### Research Scientist

May 2008–Dec. 2011

*Thomson Reuters, Research and Development, Eagan, MN, USA*

Conducted research, implemented solutions, and developed and tested algorithms in the following projects:

- *Document recommendation using link prediction approach:* In a vertical search engine, user selects some of the query results and saves in her folder. Using these documents (as seed data) and huge amount of user behavior data (such as co-view and co-cited), relationships between documents were derived. This can be represented and visualized by a graph. By estimating several link prediction measures such as rooted PageRank, hitting time, common neighbors, and shortest path, new documents are recommended to the user.
- *Hierarchical agglomerative clustering based on common neighbors similarity:* In this research, we are dealing with large data (over seven million documents), in five steps, the complexity of clustering algorithm is reduced: (i) instead of individual data, groups are clustered; (ii) in each iteration, only a small number of samples from large groups are selected for clustering; (iii) fast combination similarities (based on centroid) are proposed which is called "clustering based on common neighbors"; (iv) in every iteration, instead of calculating centroids, they are estimated from centroids in previous iteration; and (v) in each iteration, instead of merging one pair of objects, multiple pairs are merged.
- *Extracting predictive social structures from text data:* By mining the content associated with individual persons or organizations (nodes), and using semi-supervised machine learning techniques, semantic document representation such as Latent Dirichlet Allocation (LDA) and Latent Semantic Indexing (LSI), the social ties between nodes are predicted.
- *Social link classification:* Social ties among users in a professional network (professional vs. personal links) are categorized to filter out personal relations. The goal was to assess the value of the network by estimating the weight of professional links compared to that of personal ones, and to perform network analysis tasks on professional networks such as professional community detection, and weak tie analysis.

- *Document segmentation*: The objective was to convert unstructured text data into structured format by segmenting the content using supervised learning techniques including multiple Support Vector Machine (SVM) classifiers, and graphical models such as conditional random fields.
- *Automatic change annotation*: In legal domain, it is important to annotate changes among different revisions of a legal document which is associated with a particular case (for example revisions of a patent during the filing process). Many text mining tasks such as zoning and text classification are performed to prepare document revisions for sequence alignment using dynamic programming.
- *Learning user profile*: The goal was to learn user profile such as occupation and gender from user generated tags in social media sites such as Flickr. One of the applications of this research is in query processing. By learning user profile and background, non-relevant query results to the user can be filtered out.
- *Extracting taxonomy from text data*: Taxonomic relations between domains or document clusters from text data were extracted and visualized using statistical learning methods. Generated nodes in the taxonomy tree were labeled using  $\chi^2$  scoring method. A gap statistics approach was employed to estimate the number of leaves in each level of the taxonomy.
- *Topic network analysis in a polarized community*: In a polarized society (liberal vs. conservative, democrat vs. republican, and so on), controversial issues (gun right, abortion, global warming, immigration, health care reform, and so on) are debated using a polarized vocabulary (for example pro-life vs. pro-choice). By visualizing these polarized words by a dynamic topic network (evolving network by time), we were able to derive a correlation between the drastic changes in topic network topology and social and political crisis.
- *Learning social roles or extracting transaction network from social network*: Given a social network of a financial community, only using the structure of the network and without any knowledge about the members, social roles (for example sell-side/buy-side) of the members are predicted. Using this prediction, we are able to extract implicit transaction network from the explicit social network. Several machine learning algorithms such as SVM supervised learning and self-training semi-supervised learning were employed. By introducing two types of social roles including node (permanent) and link (temporary) social roles, two novel algorithms called supervised random walk and self-avoiding random walk were also implemented.

**Postdoctoral Research Associate**

Sept. 2007–Apr. 2008

*Pattern Analysis and Machine Intelligence Lab, Department of Electrical and Computer Engineering, University of Waterloo, Waterloo, Ontario, Canada*

- Contributed in a Collaborative Research and Development (CRD) grant proposal submitted to NSERC on: *Locally Sensitive Email Summarizer for Mobile Environment*. I prepared technical section of the proposal and contributed on other parts.
- Conducted research on:
  - . Unsupervised and supervised learning of social structure from text.
  - . Taxonomy extraction from very large databases such as Web.
  - . Taxonomy-based text categorization and query-relevant document representation.
- Mentoring graduate students in the PAMI lab.

**Research Assistant**

2002–2007

*Pattern Analysis and Machine Intelligence Lab, Department of Electrical and Computer Engineering, University of Waterloo, Waterloo, Ontario, Canada*

- Conducted research on using text data to extract non-trivial information such as keywords and social structures using text mining techniques and machine learning algorithms.
- Implemented machine learning tasks such as clustering and classification for text data.
- Developed feature ranking and weighting methods which aggressively reduce number of features to deal with high dimensionality of text data (methods can be applied to a wide range of high dimensional problems including text data, bioinformatics, and gene expression data).
- Developed domain-specific text mining tasks such as building domain-specific stopword lists, and domain-specific keyword extraction.

**Research Assistant**

2003–2007

*Learning Objects Repositories NETwork (LORNET), Department of Electrical and Computer Engineering, University of Waterloo, Waterloo, Ontario, Canada*

LORNET was organized around six themes from six Canadian universities including University of Waterloo. It was a five million Dollar project for five years (2001-2006) funded by NSERC.

- Developed automatic keyword extraction tool and metadata based image retrieval with LORNET team in the University of Waterloo.
- Coordinated and conducted project on learning and visualizing social networks from usage and content information.

- Developed algorithm to extract taxonomy and pseudo-ontology from text data.

TEACHING  
EXPERIENCE

<b>Instructor</b>	2012–present
<i>University of Ontario Institute of Technology, Oshawa, ON, Canada</i>	
◦ Software Project Management	Winter 2013
◦ Real-Time Systems and Control	Winter 2013
◦ Knowledge Discovery and Data Mining (Graduate Course)	Fall 2013
◦ Design and Analysis of Algorithms	Fall 2013
◦ Software Project Management	Winter 2014

INDUSTRY  
EXPERIENCE

<b>Project Manager</b>	2000–2002
<i>Strategic Planning and Study Center, Irankhodro Automotive Industries (IKCO), Tehran, Iran</i>	

- Enterprize Architecture for Public Transportation Sector
  - . Managed team of four system analysts to design, finalize and issue Enterprize Architecture Blueprint of the Department.
  - . Proposed and documented an integrated information system blueprint to support all information and services in re-structuring vehicle information system project.
  - . Integrated all information related to vehicles, drivers, dealers, and insurers in nation-wide enterprize information architecture using the Zachman Framework , System Architect 2000, and UML.
  - . Re-engineered business processes and operations from Information Technology and Information Systems (IT/IS) perspective.
- Intelligent Transportation System (ITS)
  - . Coordinated systems development for application of intelligent transportation system to control public transportation to improve safety, customer satisfaction, and to decrease driving offenses. The duty included directing staff and project requirements including information needs, business analysis, and programming.
  - . Managed development, planning, analysis, evaluation, and prioritization of deliverables and requirements, and set phases and deadlines.
  - . Conducted and designed Trip Event and Data Recorder (TEDR) system in front-end layer to collect all vehicle and trip event data including speed and position of vehicle using Geographical Positioning System (GPS) and record all events on smart card.
  - . Managed a team including two system analysts, one database analyst and five developers.

**Information Systems and Technology Analyst** 1998–1999

*Iran Productivity and Management Study Center, Tehran, Iran*

*Iran Telecommunication Research Center, Tehran, Iran*

- Ministry of Labour Business Process Re-engineering (BPR)
  - . Conducted business analysis, and designed conceptual model of Enterprise Information Architecture (EIA) for the Ministry of Labour as part of Business Process Re-engineering project.
- National Information Infrastructure Strategic Planning (awarded the third place of national Kharazmi award for the most innovative project)
  - . Conducted identifying key technologies that enable Information Technology for developing countries and to apply the model in a real case for Iran using technology clustering scheme. The research was structured around a three dimensional configuration of strategy development process. These dimensions are key technologies, socioeconomic sectors, and applications.

**Research Associate** 1994–1998

*Institute of Science and Technology, Tehran, Iran*

- Designed and implemented Digital Signal Processing module for Telemetry Systems
  - . Accomplished matching hardware, operating system, software, and application system capacity to present/predict needs of information system users to meet service level requirements for throughput, response time, turnaround time, and availability.
  - . Conducted digital signal and data processing team to develop embedded software, GUI and monitoring software in central control room, and implemented a micro controller based hardware and interfaces for a real-time telemetry system.
- Conducted various research projects including:
  - . Estimating far-field antenna pattern from near field using genetic algorithms.
  - . Optimization of optical systems using genetic algorithms.
  - . Fuzzy rules generation using genetic algorithms.
  - . Cursive typewritten character recognition.

**Design Engineer** 1991–1992

*Iran Telecommunication Research Center, Tehran, Iran*

- In-Circuit Emulator Design

- . Designed and implemented a multiprocessor system and the embedded software for in-circuit emulation of a microprocessor-based telephone switching system.

#### SERVICE AND PROFESSIONAL ACTIVITIES

##### **Academic Committees**

- Department of Electrical, Computer, and Software Engineering Curriculum Committee 2012-2013
- Software Engineering Program Curriculum Committee 2013-present
- FEAS hiring committee for Software Engineering position, 2013-present
- FSC hiring committee for Computer Science position, 2014-present

##### **Program Committees**

- The 16th Pacific-Asia Conference on Knowledge and Data Discovery and Data Mining (PAKDD-2012), Kuala Lumpur, Malaysia, 29 May–1 June 2012.
- The IEEE International Conference on Data Mining (ICDM-2011), Vancouver, BC, Canada, 11–14 Dec. 2011.
- The IEEE International Conference on Data Mining (ICDM-2010), Sydney, Australia, 13–17 Dec. 2010.
- The IEEE International Conference on Data Mining (ICDM-2008), Pisa, Italy, 15–19 Dec. 2008.
- The AICCSA-08 Pattern Recognition and Image Processing Track, Doha, Qatar, 31 March–4 April, 2008.

##### **Workshop Chair**

- The first international Workshop on Social Recommendation in conjunction with The 5th International Conference on Social Informatics (SocInfo2013), to be held in Kyoto, Japan, 25–27 Nov. 2013.
- The UW and IEEE Kitchener-Waterloo Section Joint Workshop on Knowledge and Data Mining, University of Waterloo, Ontario, Canada, 30–31 October, 2006.
- The second workshop of the UW-IEEE joint chapter of signal processing/neural network/computer societies on Image Processing: Methodologies and Applications, University of Waterloo, Waterloo, Ontario, Canada, 6–7 Nov. 2003.

##### **Peer Review**

###### ◦ **Book Chapter**

- . Computational Methods of Feature Selection, edited by Huan Liu and Hiroshi Motoda, Chapman and Hall/CRC Press

###### ◦ **Journals**



- . The Journal of the American Society for Information Science and Technology
- . IEEE Transactions on Knowledge and Data Engineering
- . IEEE Transactions on Fuzzy Systems
- . Knowledge and Information Systems
- . Pattern Recognition Letters
- . Information Processing Letters
- . Journal of Intelligent and Fuzzy Systems
- . Journal of Information Fusion
- . Intelligent Automation and Soft Computing
- . SCS Simulation, Transactions of the International Society for Modeling and Simulation

o **Conferences**

- . The 16th Pacific-Asia Conference on Knowledge and Data Discovery and Data Mining (PAKDD-2012), Kuala Lumpur, Malaysia, 29 May–1 June 2012.
- . The IEEE International Conference on Data Mining (ICDM-2011), Vancouver, BC, Canada, 11–14 Dec. 2011.
- . The IEEE International Conference on Data Mining (ICDM-2010), Sydney, Australia, 13–17 Dec. 2010.
- . Fifth International Conference on Digital Information Management (ICDIM 2010), Thunder bay, ON, Canada, 5–8 July, 2010.
- . Hypertext 2009, 20th ACM Conference on Hypertext and Hypermedia, Torino, Italy, 29 June–1 July, 2009.
- . The IEEE International Conference on Data Mining (ICDM-2008), Pisa, Italy, 15-19 Dec. 2008.
- . The 19th International Conference on Pattern recognition (ICPR) Tampa, FL, Dec. 8–11. 2008
- . The 6th ACS/IEEE International Conference on Computer Systems and Applications (AICCSA-08), Doha, Qatar, March 31–April 4, 2008
- . Seventh International Workshop on Multiple Classifier Systems (MCS2007), Prague, Czech Republic, May 23–25, 2007
- . The 3<sup>rd</sup> annual LORNET Scientific Conference, Montreal, Quebec, November 8–10, 2006
- . The 11<sup>th</sup> Iberoamerican Congress on Pattern Recognition, Cancun, Mexico, Nov. 14–17, 2006
- . IEEE International Conference on Systems, Man, and Cybernetics, Taipei, Taiwan, Oct. 8–11, 2006

- . The 2<sup>nd</sup> annual LORNET Scientific Conference, Vancouver, BC, Canada, Nov. 14–18, 2005
- . S+SSPR 2004: Structural and syntactic Pattern recognition, Lisbon, Portugal, Aug. 18–20, 2004
- . IJCNN 2003: International Joint Conference on Neural Networks, Portland, Oregon, July 20–24, 2003

### Membership

- IEEE Senior Member

### PUBLICATIONS

#### PATENTS

1. Dietmar H. Dorr, Masoud Makrehchi, Carol Steele, “Systems, Methods, and Interfaces for Analyzing Conceptually-Related Portions of Text”. US Patent 20130086470.
2. Masoud Makrehchi, Sameena Shah, Wenhui Liao, “System and Method for Forming Prediction Using Event-Based Sentiment Analysis”. US Patent Pending.
3. Wenhui Liao, Sameena Shah, Masoud Makrehchi, “System and Method for Determining and Utilizing Successful Observed Performance”. US Patent Pending.

#### BOOK CHAPTERS

4. M. Makrehchi, M. S. Kamel. “Aggressive Feature Selection by Feature Ranking”. In Computational Methods of Feature Selection, Huan Liu and Hiroshi Motoda, Eds.; Chapman and Hall/CRC Press, pp. 313–333, 2007.

#### JOURNAL PAPERS

5. M. Makrehchi. “Predicting Political Conflicts from Polarized Social Media”, accepted in *Web Intelligence Journal*.
6. M. Makrehchi. “Evaluating Feature Ranking Methods in Text Classifiers”, to appear in *Intelligent Data Analysis Journal*.
7. M. Makrehchi, M. S. Kamel. “Feature Ranking Fusion for Text Classification”, *Intelligent Data Analysis Journal*. Vol. 16, pp. 879–896, 2012.
8. M. Makrehchi, M. S. Kamel. “Impact of Term Dependency and Class Imbalance on the Performance of Feature Ranking Methods for Text Classifiers”, *International Journal of Pattern Recognition and Artificial Intelligence*. Vol. 25, No. 7, pp. 953–983, 2011.
9. M. Makrehchi. “Taxonomy-based Document Clustering”, *Journal of Digital Information Management*. Vol. 9, No. 2, pp. 79–86, 2011.
10. M. Makrehchi, M. S. Kamel. “An Information Theoretic Approach to Generating Fuzzy Hypercubes for If-Then Classifiers”, *Journal of Intelligent and Fuzzy Systems*. Vol. 22, pp. 33–52, 2011.

11. R. A. Dara, M. Makrehchi, M. S. Kamel. "Data Partitioning in Multiple Classifier Systems", *IEEE Transactions on Knowledge and Data Engineering*. Vol. 22, No. 4, pp. 508–522, 2010.
12. I. Chepurna, S. Aghababaei, M. Makrehchi. "How to Predict Social Trends by Mining User Sentiments", *the International Conference on Social Computing, Behavioral-Cultural Modeling, and Prediction (SBP-2015)*, Washington DC, USA, pp. 270-275, March 31- April 3, 2015.
13. M. Makrehchi. "The Correlation Between Language Shift and Social Conflicts in Polarized Social Media", *the IEEE/WIC/ACM International Conference on Web Intelligence (WI-14)*, Warsaw, Poland, PP. 166–171, Aug. 11–14, 2014.
14. W. Liao, S. Shah, M. Makrehchi. "Winning by Following the Winners: Mining the Behaviour of Stock Market Experts in Social Media", *the International Conference on Social Computing, Behavioral-Cultural Modeling, and Prediction (SBP-2014)*, Washington DC, USA, pp. 103–110, April 2–4, 2014. [Best paper award]
15. M. Makrehchi, S. Shah, W. Liao. "Stock Prediction Using Event-based Sentiment Analysis", *In: Proceedings, the IEEE/WIC/ACM International Conference on Web Intelligence (WI-13)*, Atlanta, GA, pp. 337–342, Nov. 17–20, 2013. [acceptance rate: 20%]
16. M. Makrehchi. "Social Links Recommendation by Learning Hidden Topics", *In: Proceedings, ACM Conference on Recommender Systems (RecSys-2011)*, Chicago, IL, pp. 189–195, Oct. 23–27, 2011. [acceptance rate: 22%]
17. M. Makrehchi. "Query-relevant Document Representation for Text Clustering", *In: Proceedings, Fifth International Conference on Digital Information Management (ICDIM 2010)*, Thunder bay, ON, Canada, pp. 132–138, July 5–8, 2010.
18. M. Makrehchi. "Text Clustering Using Taxonomy", *The 2008 IEEE/WIC/ACM International Conference on Web Intelligence, Sydney, Australia, Dec. 9–12, 2008*. [acceptance rate: 19%]
19. M. Makrehchi, M. S. Kamel. "Automatic Extraction of Domain-Specific Stop-words from Labeled Documents", *In: Proceedings, the 2008 European Conference on Information Retrieval (ECIR2008)*, Glasgow, Scotland, pp. 222–233, Mar. 30–Apr. 3, 2008. [acceptance rate: 23%]
20. M. Makrehchi, M. S. Kamel. "A Text Classification Framework with a Local Feature Ranking for Learning Social Networks", *In: Proceedings, the 2007 IEEE International Conference on Data Mining, (ICDM 2007)*, Omaha, NE, USA, pp. 589–594, Oct. 28–31, 2007. [acceptance rate: 19%]
21. M. Makrehchi, M. S. Kamel. "Automatic Taxonomy Extraction Using Google and Term Dependency", *In: Proceedings, the 2007 IEEE/ WIC/ACM International Conference on Web Intelligence (WI'07)*, Silicon Valley, CA, pp. 321–325, Nov. 2–5, 2007. [acceptance rate: 17%]

22. M. Makrehchi, M. S. Kamel. "Learning Social Networks from Web Documents Using Support Vector Classifiers", In: *Proceedings, the 2006 IEEE/WIC/ACM International Conference on Web Intelligence, Hong Kong, pp. 88-94, Dec. 18-22, 2006*. [acceptance rate: 18%]
23. M. Makrehchi, M. S. Kamel. "Learning Term Dependency Links Using Information Theoretic Inclusion Measure", In: *Proceedings, the 2007 ICDM Workshop on Mining Graphs and Complex Structures (MGCS2007), Omaha, NE, USA, pp. 423-428, Oct. 28-31, 2007*.
24. M. Makrehchi, M. S. Kamel. "Combining Feature Ranking for Text Classification", In: *Proceedings, the 2007 IEEE International Conference on Systems, Man and Cybernetics, Montreal, Canada, pp. 510-515, Oct. 7-10, 2007*.
25. M. Makrehchi, M. S. Kamel. "Learning Social Networks Using Multiple Resampling Method", In: *Proceedings, the 2007 IEEE International Conference on Systems, Man and Cybernetics, Montreal, Canada, pp. 406-411, Oct. 7-10, 2007*.
26. M. Makrehchi, M. S. Kamel. "Building Social Networks from Web Documents: A Text Mining Approach", In: *Proceedings, the 2nd LORNET Scientific Conference, Vancouver, BC, Canada, Nov. 14-18, 2005*.
27. M. Makrehchi, M. S. Kamel. "Text Classification Using Small Number of Features", In: *Proceedings, Machine Learning and Data Mining Conference (MLDM172005), Leipzig, Germany, pp. 580-589, July 9-11, 2005*. [acceptance rate: 29%]
28. R. A. Dara, M. Makrehchi, M. S. Kamel. "Data Partitioning Evaluation Measures for Classifier Ensembles", In: *Proceedings, the 6th International Workshop on Multiple Classifier Systems, Seaside, CA, USA, pp. 306-315, June 13-15, 2005*.
29. R. A. Dara, M. Makrehchi, M. S. Kamel. "An Information-Theoretic Measure to Evaluate Data Partitions in Multiple Classifiers", In: *Proceedings, IEEE SMC-2004, The Hague, The Netherlands, pp. 4826-4831, Oct. 10-13, 2004*.
30. M. Makrehchi, M. S. Kamel. "A Fuzzy Set Approach to Extracting Keywords from Abstracts", In: *Proceedings, NAFIPS-IEEE Annual Meeting of the Fuzzy Information Processing, Banff, Canada, pp. 528-532, June 27-30, 2004*.
31. M. Makrehchi, M. S. Kamel. "An Information Theoretic Approach to Generating Membership Functions from Real Data", In: *Proceedings, NAFIPS-IEEE Annual Meeting of the Fuzzy Information Processing, Chicago, IL, USA, pp. 44-49, July 24-26, 2003*.
32. M. Makrehchi, O. Basir, M. S. Kamel. "Generating Fuzzy Membership Function Using Information Theory Measures and Genetic Algorithms", In: *Proceedings, International Fuzzy Systems Association Conference- IFSA, Istanbul, Turkey, pp. 603-610, June 29-July 2, 2003*.

OTHER  
PUBLICATIONS

33. M. Makrehchi, S.D. Katebi. “Design and Analysis of Multi-variable Fuzzy Control Systems”, *Journal of Science and Technology*, Vol. 21, No. 1, pp. 95–110, 1997.
34. S.D. Katebi, M. Makrehchi. “Modeling and Control of Multi-variable Fuzzy Systems”, *System Science Journal*, Vol. 21, No. 4, pp. 5–15, 1995.
35. M. Makrehchi. “Application of Genetic Algorithms in Fuzzy Rules Generation”, In: *Proceedings, of 2nd IEEE Conf. on Evolutionary Computation (EC-IEEE’95)*, Perth, Australia, Vol. 1, pp. 251–256, Nov. 29–Dec. 1, 1995.
36. S.D. Katebi, M. Makrehchi. “Comparative Study of Two Fuzzy Logic Control Systems Design”, In: *Proceedings, 3rd IEEE Conf. on Control Applications (IEEE-CCA’94)*, Glasgow, UK, pp. 653–658, Aug. 24–26, 1994.
37. S.D. Katebi, M. Makrehchi. “Multi-variable Fuzzy Control Systems Design”, In: *Proceedings, Int. Conference on System Engineering (ICSE-94)*, Coventry, UK, Sept. 1994.

## THESES

38. “Feature Ranking for Text Classifiers”, Ph.D. dissertation, Department of Electrical and Computer Engineering, University of Waterloo, Waterloo, ON, Canada, 2007.
39. “Multi-variable Fuzzy Control Systems”, M.S. thesis, Department of Computer Science and Engineering, Shiraz University, Shiraz, Iran, 1994.

## SUPERVISION

## GRADUATE STUDENTS

Somayyeh Aghababaei (PhD student, 2013-present); Interpolative Learning

Iuliia Chepurna (MSc Student, 2013-present); Interpolating Missing Opinions

Mehran Kamkarhaghighi (PhD Student, 2015-present); Social Analytics for Medical Applications

UNDERGRADUATE  
STUDENTS

Kayla Martell, Syed Mohib Rab, Melissa Singh (2012-2013); Snippets: A vertical search engine for academic resources

Visal Chea, Spencer Johnstone, Rubeshan Sathananthan (2012-2013); Bluetooth business card

[Co-supervisor] Mahalia Cardinal, Rebecca Cooper, Ila Dutta, David Petras, Kailey Renton (2013-2014); SimBul: Modelling and Simulation of bullying behavior using social agents

Kosalan Balarajah, Shoebkhan Bihari, Nishant Bhatt, Mihir Patel (2013-2014); Cloud Computing on Mobile Devices [Third place in Capstone competition]

[Co-supervisor] Daniel Smullen, Jonathan Gillett, Joseph Heron (2013-2014); Automation of MTO COMPASS Vision System [First place in Capstone competition]

Kelly Unwin, Christopher Zwarts, Marco Ng, Parth Desai (2014-2015); Collaborative Virtual Reality Environment

Parth Patel, Devan Shah, Ravi Patel, Miguel Arindaeng (2014-2015); Invisible Computer-Human Interfaces (ICHI)

INVITED TALKS  
AND LECTURES

*“Let Them Build your Business: From Social Media to Financial Market ”*, MBA Conference, Ottawa, ON, Canada . 2015

*“Predicting Unpredictable”*, Sharif University of Technology Alumni- Toronto Chapter, Toronto, ON, Canada . 2015

*“Social Link Recommendation”*, 2013 INFORMS meeting, Minneapolis, MN, USA. 2013

*“Event-Based Sentiment Analysis for Stock Market Prediction Using Social Media”*, 2013 INFORMS meeting, Minneapolis, MN, USA. 2013

*“Social Link Recommendation”*, 2012 Symposium on Advanced Intelligent Systems, Waterloo, ON, Canada Dec. 2012

*“Does Rhetoric Suggest a Social Conflict?”*, The #Influence12 Symposium & Workshop, Dalhousie University, Halifax, Nova Scotia, Canada Sep. 2012

*“Conflict Thermometer: Predicting Social Conflicts by Analyzing Language Gap in Polarized social Media”*, SBP 2012 Challenge Award, University of Maryland, College Park, MD Apr. 2012

*“Making Sense of Social Data”*, York University, ON, Canada Dec. 2011

*“Mining Social Data: An Introduction”*, 2011 Symposium on Advanced Intelligent Systems, Waterloo, ON, Canada Dec. 2011

*“Making Sense of Social Data”*, Ryerson University, ON, Canada Nov. 2011

*“Mining Social Data”*, University of Ontario Institute of Technology, ON, Canada Nov. 2011

*“Invited Panelist: SMUC Workshop@CIKM”*, Search and Mining User-generated Contents Workshop at the ACM Conference on Information and Knowledge Management, Toronto, ON, Canada Oct. 2010

- 
- “*Content-Based Social Link Analysis*”, Professional Networks Summit  
Thomson Reuters Headquarter, New York City, NY, USA Apr. 2010
- “*Mining Domain-Specific Text*”  
Thomson Corporation, Eagan, MN, USA Dec. 2007
- “*Invited Lecture: Introduction to Text Categorization*”  
Graduate course: Data and Knowledge Modeling and Analysis  
University of Waterloo, Waterloo, ON, Canada Oct. 2007
- “*From Text to Social Networks*”  
Yahoo! Inc, Montreal, QC, Canada Sep. 2007
- “*Learning Social Networks from Text*”  
TAMALE Seminar, The Text Analysis and Machine Learning Group,  
University of Ottawa, Ottawa, ON, Canada Aug. 2007
- “*Introduction to Enterprise Information Architecture Frameworks*”  
First Iranian National Conference on Enterprise Architecture  
Tehran, Iran Nov. 2003
- TALKS AND PRESENTATIONS “*Mining Social Media for Predicting New Trends in News*”  
Innovation Summit, Thomson Reuters Corp., Eagan, MN, USA May 2009
- “*Automatic Extraction of Domain-Specific Stopwords from Labeled Documents*”  
ECIR-2008, University of Glasgow, Glasgow, UK Apr. 2008
- “*Learning Social Networks Using Support Vector Classifiers*”, The 3rd LOR-  
NET Scientific Conference,  
TELUQ-UQAM University, Montreal, QC, Canada Nov. 2006
- “*Aggressive Feature Selection for Text Classifiers*”  
PAMI Seminars, University of Waterloo, Waterloo, ON, Canada Feb. 2006
- “*From Content to Social Networks: Mining the Web to Explore Social Rela-  
tions*”  
ECE Grad Talks, University of Waterloo, Waterloo, ON, Canada Feb. 2006
- “*Unsupervised Keyword Extraction based on Corpora*”, The 2nd LORNET  
Scientific Conference,  
Simon Fraser University, Vancouver, BC, Canada Nov. 2005
- “*A Corpus-Based Unsupervised Keyword Extraction*”  
Graduate Research Conference  
University of Waterloo, Waterloo, ON, Canada Apr. 2005

*“Introduction to Metadata Mining”*

LORNET Seminars

University of Waterloo, Waterloo, ON, Canada

May 2004