Final Exam CS 598tar

Please read carefully: Answers to this exam are due by email by Saturday, May 12th, 11:59pm Central time. Please send answers only in plain text in the body of the email. Do not send attachments. Please adhere strictly to the format below, as exam may be auto-graded:

- Subject line: "CS598TAR EXAM" (all in upper case letters).

- First line of the email: Your full name.

- Subsequent lines: One answer per line in the format: "Q#" (where # is the question number) followed by "." followed by the letter indicating the answer choice made (in uppercase letters). For example:

Q1. A

Q2. C

…

Please answer the multiple choice questions below by choosing the *best* statement to characterize the contribution of each paper in question, among the choices provided. Note that, multiple choices might apply partially to different degrees. Please indicate the best choice according to your understanding of the true contribution of each paper. Note that, the papers are cited by numbers. Please refer to the reference list at the end of his exam to see the full citations that the numbers refer to.

Q1. "Can Instagram posts help characterize urban micro-events?" [34]

(a) Is the first paper to use Instagram for urban event detection.

(b) Improved urban event detection in Instagram by removing false positives.

(c) Described a solution that breaks down events into smaller stages and identifies the time and location of each stage.

(d) Integrated Instagram and Twitter to identify urban micro-events.

Q2. "On Source Dependency Models for Reliable Social Sensing: Algorithms and Fundamental Error Bound." [37]

(a) Introduced the first maximum likelihood estimation algorithm for social sensing.

(b) Developed the first maximum likelihood algorithm for jointly identifying the reliability of sources and correctness of claims for the case of non-independent sources.

(c) Extended previous fact-finding literature from binary claims (i.e., "true/false" statements) to real-valued measurements (e.g., temperature, pressure, etc).

(d) None of the above.

Q3. "Can Deep Learning Revolutionize Mobile Sensing?" [16]

(a) Introduced the mathematical foundations of deep learning.

(b) Argued that deep learning systems can be implemented on mobile devices.

(c) Described augmented reality applications for wearable devices.

(d) Improved routing algorithms for multi-hop sensor networks in the presence of node mobility using a deep learning approach.

Q4. "Debiasing Crowdsourced Quantitative Characteristics in Local Businesses and Services" [39]

(a) Used crowdsourcing for accurate tracking of shopping carts in local businesses.

(b) Developed a maximum likelihood estimator that improves accuracy of reconstructing real-valued/integer-valued measurements from observers with measurement bias.

(c) Developed a smartphone app that reports queueing times in restaurants.

(d) Introduced a data cleaning service that separates rumors from ground truth.

Q5. "Quantifying Flexibility of Residential Thermostatically Controlled Loads for Demand Response…" [44]

(a) Studied the potential for exploiting supply-following loads to mitigate energy consumption spikes.

(b) Addressed security of smart grid applications.

(c) Introduced the new concept of demand-response.

(d) Designed a smarter thermostat for more precise temperature control in residential apartment buildings.

Q6. "Subjective Logic Operators in Trust Assessment: An Empirical Study" [50]

(a) Was the first paper to introduce the idea of subjective logic.

(b) Improved the design of subjective logic operators.

(c) Argued that subjective logic is fundamentally unsuitable for trust assessment applications.

(d) Applied subjective logic to trust assessment of Twitter feeds.

Q7. "A Survey of Incentive Mechanisms for Participatory Sensing" [49]

(a) Was the first paper to introduce the concept of participatory sensing.

(b) Was the first paper to introduce the concept of mechanism design.

(c) Was the first paper to argue for non-monetary incentives in participatory sensing applications.

(d) Presented a survey of mechanisms used to incentivize sources to collect/share information.

Q8. "Experiences with GreenGPS – Fuel-Efficient Navigation using Participatory Sensing" [42]

(a) Described a new vehicular navigation system, called GreenGPS.

(b) Developed a system for fuel savings by predicting future timing of signalized intersections.

(c) Presented design improvements and additional evaluation for GreenGPS.

(d) Extended GreenGPS to apply to autonomous cars.

Q9. "A Picture of Instagram is Worth More Than a Thousand Words" [26]

(a) Developed algorithms for detecting urban points of interest with Instagram.

(b) Developed algorithms for detecting short-term events, such as concerts, on Instagram.

(c) Developed algorithms for detecting mobile events (such as Tornadoes) on Instagram.

(d) All of the above.

Q10. "On Truth Discovery in Social Sensing: A Maximum Likelihood Estimation Approach" [27]

(a) Developed a fact-finding algorithm for independent sources and independent claims.

(b) Developed a fact-finding algorithm for non-independent sources and independent claims.

(c) Developed a fact-finding algorithm for independent sources and non-independent claims.

(d) Developed a fact-finding algorithm for non-independent sources and non-independent claims.

Q11. "The Sound of Silence" [22]

(a) Developed algorithms for using intervals of silence as a covert communication channel to convey encoded secrets.

(b) Extended Shannon's information theory to account for the fact that the length of intervals of silence can themselves be used as information signals.

(c) Developed algorithms for detecting groups of individuals shopping together.

(d) Developed algorithms for detecting parties of the same conversation.

Q12. "A Semi-Supervised Learning Approach for Robust Indoor-Outdoor Detection with Smartphones" [13]

(a) Used a machine learning approach to detect whether a person is indoors or outdoors.

(b) Used transfer learning to reduce the need for indoor/outdoor detector training and data labeling.

(c) Exposed deficiencies of using GPS signals for purposes of indoor/outdoor detection.

(d) All of the above.

Q13. "DeepSense: A Unified Deep Learning Framework for Time-Series Mobile Sensing Data Processing" [45]

(a) Developed solutions for compressing deep neural networks to fit on mobile devices.

(b) Developed a Bayesian approximation that allows estimation of uncertainty in deep learning results.

(c) Proposed an architecture for deep learning from multiple sensor data streams.

(d) Proposed solutions that reduce the need for labeled data for deep neural network training purposes.

Q14. "Pushing the Spatio-Temporal Resolution Limit of Urban Air Pollution Maps" [43]

(a) Improved the design of static weather stations in a major city.

(b) Reported experiences with using sensors in people's homes to improve the spatio-temporal resolution of pollution measurement in a big city.

(c) Developed statistical techniques for improving the resolution of pollution measurements in a big city using a limited number of mobile pollution sensors.

(d) Used air pollution maps to infer the most popular tourist routes in a big city.

Q15. "Social Fusion: Integrating Twitter and Instagram for Event Monitoring" [35]

(a) Developed algorithms for combining tweets and Instagram images that pertain to the same event.

(b) Reduced false positives in event detection compared to Twitter-based detection algorithms.

(c) Increased the number of correctly detected events compared to Instagram-based detection algorithms.

(d) All of the above.

Please answer the multiple choice questions below by choosing the paper that *best* matches the contribution mentioned in the question. Note that, multiple choices might apply partially to different degrees. Please indicate the best choice according to your understanding of the true contribution of each paper. Note that, the papers are cited by numbers. Please refer to the reference list at the end of his exam to see the full citations.

Q16. A service that explains sensor anomalies by observing social media feeds:

(a) ClariSense [32].

(b) Shuochao Yao *et al.* [37].

(c) CityDrive [41].

(d) RDeepSense [46].

Q17. A service that advises on driving speed to minimize expected fuel consumption in view of predicted Green/Red traffic light timing at signalized intersections.

(a) ClariSense [32].

(b) Shuochao Yao *et al.* [37].

(c) CityDrive [41].

(d) GreenGPS [42].

Q18. An algorithm that estimates uncertainty in deep learning outputs.

(a) OverLay [17].

(b) DeepSense [45].

(c) RDeepSense [46].

(d) DeepIoT [47].

Q19. An augmented reality application that adds annotation bubbles to physical objects viewed by smart phones.

(a) SmartLight [14].

(b) OverLay [17].

(c) QueueVadis [24].

(d) GeoBurst [28].

Q20. The best example of early work on event detection using Twitter.

(a) Earthquake shakes Twitter users [25].

(b) GeoBurst [28].

(c) EvenTweet [30].

(d) ClariSense [32].

Q21. A paper that helps eliminate rumors in crowd-sensing results.

(a) Nonverbal social sensing [19].

(b) The sound of silence [22].

(c) Humans as Sensors [36].

(d) CityDrive [41].

Please answer the multiple choice questions below by choosing the paper that *best* helps address the problem mentioned. Note that, multiple choices might apply partially to different degrees. Please indicate the best choice according to your understanding of the true contribution of the papers on the reading list. Note that, the papers are cited by numbers. Please refer to the reference list at the end of his exam to see the full citations.

Q22. In the final battle for intergalactic peace, your acquaintance Tom (who you do not fully trust) said that his friend Gamora (who Tom does not fully trust) said that she managed to gain possession of the Infinity Gauntlet, an item of great global power. If you do not know Gamora yourself (you only had interactions with Tom, although Tom explained the history of his interactions with Gamora), which of the following papers best help you assess the likelihood that Gamora indeed has the Gauntlet?

(a) Nonverbal Social Sensing [19].

(b) ClariSense [32].

(c) On Source Dependency Models for Reliable Social Sensing [37].

(d) Subjective Logic [50].

Q23. Soon after, the Intergalactic Social Network, GalaCast, fills with posts claiming that Gamora has in fact been slain by an evil Titan. Tens of thousands of sources whose reliability you do not know report various conflicting data on the matter. Which of the following papers might best help assess the veracity of the news on this Twitter-like network?

(a) Nonverbal Social Sensing [19].

(b) ClariSense [32].

(c) On Source Dependency Models for Reliable Social Sensing [37].

(d) Subjective Logic [50].

Q24. In the meantime, pollution sensors on the remote land of Wakanda are reporting unusual concentrations of ash-like material spreading in the air. If Wakanda is covered by the Twitter-like Intergalactic Social Network, GalaCast, which of the following papers describe solution that may help collect the most pertinent (albeit unverified) information from GalaCast that might explain the unusual phenomenon? Assume that you do not know the reliability of sources.

(a) Nonverbal Social Sensing [19].

(b) ClariSense [32].

(c) Pushing the Spatio-Temporal Resolution Limit of Urban Air Pollution Maps [43].

(d) Subjective Logic [50].

Q25. Which of the following papers includes a study of behaviors that correlate with doing well on job interviews?

(a) Nonverbal Social Sensing [19].

(b) ClariSense [32].

(c) On Source Dependency Models for Reliable Social Sensing [37].

(d) Subjective Logic [50].

Q26. Your friend has a startup that sells aides for "distraction-free" learning. Specifically, your friend developed a VR headset that displays learning material (e.g., a book) while tracking the user's gaze, and gently alerts the user when they start "drifting off" away from viewing the material. Which of the following papers would be most relevant to improving the energy efficiency of your friend's product?

(a) SmartLight [14].

(b) Indoor Localization [15].

(c) Ultra-Low Power Gaze Tracking for Virtual Reality [18].

(d) GruMon [23].

Please answer the multiple choice questions below by picking the work that differs most from the rest. Note that, multiple choices may apply. Please choose the best one. Papers are cited by numbers. Please refer to the reference list at the end of his exam to see the full citations.

Q27. All of the papers below use accelerometers or gyroscopes, except:

(a) VibeBin [7].

(b) Toothbrushing Monitoring using Wrist Watch [10].

(c) SmartLight [14].

(d) GruMon [23].

Q28. All of the papers below use the Expectation Maximization algorithm except:

(a) On Truth Discovery in Social Sensing [27].

(b) Joint Localization of Events and Sources in Social Networks [29].

(c) Unveiling Polarization in Social Networks [38].

(d) Debiasing Crowdsourced Quantitative Characteristics in Local Businesses and Services [39].

Q29. All of the papers below are motivated, at least in part, by the goal of increasing sustainability of smart cities, except:

(a) VibeBin: A Vibration-Based Waste Bin Level Detection System [7].

(b) Ultra-Low Power Gaze Tracking for Virtual Reality [18].

(c) CityDrive: A Map-generating and Speed-optimizing Driving System [41].

(d) Quantifying Flexibility of Residential Thermostatically Controlled Loads [44].

Q30. All of the papers below envision social media as sources of information, except:

(a) Participatory sensing [1].

(b) Human-centric Sensing [5].

(c) The Age of Social Sensing [6].

(d) Humans as Sensors [36].

Good Luck.

Readings for 1/31: Urban Sensing – Exploiting the Crowd (from early visions to the present)

1. J. Burke, D. Estrin, M. Hansen, A. Parker, N. Ramanathan, S. Reddy, M. B. Srivastava. "Participatory sensing," In Proc. *World Sensor Web Workshop, ACM Sensys*, Boulder, Colorado, October 31, 2006.
2. Andrew T. Campbell, Shane B. Eisenman, Nicholas D. Lane, Emiliano Miluzzo, and Ronald A. Peterson, "People-centric Urban Sensing," In Proc. *2nd annual international workshop on Wireless Internet (WICON)*, 2006.
3. Tarek Abdelzaher, Yaw Anokwa, Péter Boda, Jeff Burke, Deborah Estrin, Leonidas Guibas, Aman Kansal, Sam Madden, Jim Reich, "Mobiscopes for Human Spaces," *IEEE Pervasive*, Vol. 6, No. 2, pp. 20-29, April 2007.
4. Raghu Ganti, Fan Ye, and Hui Lei, "Mobile CrowdSensing: Current State and Future Challenges," *IEEE Communications Magazine - Special issue on IoT*, Vol. 49, No. 11, November 2011.
5. Mani Srivastava, Tarek Abdelzaher, Boleslaw K. Szymanski, "Human-centric Sensing," *Philosophical Transactions of the Royal Society, special issue on Wireless Sensor Networks*, Vol. 370, No. 1958, pp. 176-197, January 2012.
6. Dong Wang, Bolek Szymanski, Tarek Abdelzaher, Heng Ji, and Lance Kaplan, "The Age of Social Sensing," *IEEE Computer*, 2018.

Readings for 2/2: Personal Sensing (Home/Indoor)

7. Yiran Zhao, Shuochao Yao, Shen Li, Shaohan Hu, Huajie Shao, Tarek Abdelzaher, "VibeBin: A Vibration-Based Waste Bin Level Detection System," Proceedings of the *ACM on Interactive, Mobile, Wearable and Ubiquitous Technologies (IMWUT), also presented at Ubicomp*, Maui, HI, September 2017.
8. Anh Nguyen, Raghda Alqurashi, Zohreh Raghebi, Farnoush Banaei-kashani, Ann C. Halbower, and Tam Vu, "A Lightweight and Inexpensive In-ear Sensing System For Automatic Whole-night Sleep Stage Monitoring," *ACM SenSys*, November 2016.
9. Joshua Adkins and Prabal Dutta, "Monoxalyze: Verifying Smoking Cessation with a Keychain-sized Carbon Monoxide Breathalyzer," *ACM SenSys*, November 2016.
10. Hua Huang and Shan Lin, "Toothbrushing Monitoring using Wrist Watch," ACM SenSys, November 2016.
11. Valerie Galluzzi, Ted Herman, and Philip Polgreen, "Hand Hygiene Duration and Technique Recognition Using Wrist-worn Sensors," *IEEE/ACM IPSN*, April 2015.

Readings for 2/7: Personal Sensing (Context Detection and Localization)

12. Samuli Hemminki, Petteri Nurmi, and Sasu Tarkoma, "Accelerometer-based Transportation Mode Detection on Smartphones," ACM SenSys, November 2013
13. Valentin Radu, Panagiota Katsikouli, Rik Sarkar, Mahesh K. Marina, "A Semi-Supervised Learning Approach for Robust Indoor-Outdoor Detection with Smartphones," *ACM Sensys*, November 2014
14. Song Liu and Tian He, "SmartLight: Light-weight 3D Indoor Localization Using a Single LED Lamp," ACM Sensys, Delft, The Netherlands, November 2017
15. Manuel Eichelberger, Kevin Luchsinger, Simon Tanner, and Roger Wattenhofer, "Indoor Localization with Aircraft Signals," ACM Sensys, Delft, The Netherlands, November 2017

Readings for 2/9: Personal Sensing (Supporting Emerging Applications)

16. **Deep Learning:** Nicholas D. Lane and Petko Georgiev, "Can Deep Learning Revolutionize Mobile Sensing?" *ACM HotMobile*, February 2015

17. **Augmented Reality:** Puneet Jain, Justin Manweiler, Romit Roy Choudhury, "OverLay: Practical Mobile Augmented Reality," *ACM Mobisys*, May 2015
18. **Virtual Reality:** Tianxing Li, Qiang Liu, Xia Zhou "Ultra-Low Power Gaze Tracking for Virtual Reality," ACM Sensys, Delft, The Netherlands, November 2017 **(Critique required.)**

Readings for 2/14: Interaction Sensing (Monitoring Human Interactions)

19. Denise Frauendorfer, Marianne Schmid Mast, Laurent Son Nguyen, Daniel Gatica-Perez, "Nonverbal Social Sensing in Action: Unobtrusive Recording and Extracting of Nonverbal Behavior in Social Interactions Illustrated with a Research Example," *Journal of Nonverbal Behavior*, Vol. 38, No. 2, June 2014
20. Z. Zhou, L. Shangguan, X. Zheng, L. Yang and Y. Liu, "Design and Implementation of an RFID-Based Customer Shopping Behavior Mining System," in *IEEE/ACM Transactions on Networking*, vol. 25, no. 4, pp. 2405-2418, Aug. 2017
21. Alessandro Montanari, Cecilia Mascolo, Kerstin Sailer, and Sarfraz Nawaz, "Detecting Emerging Activity-Based Working Traits through Wearable Technology," Proc. *ACM Interact. Mob. Wearable Ubiquitous Technology (IMWUT)*, September 2017

Readings for 2/16: Group Behavior Sensing

22. Wai-Tian Tan, Mary Baker, Ramin Samadani, Bowon Lee, "The Sound of Silence," ACM Sensys, November 2013
23. Rijurekha Sen, Youngki Lee, Kasthuri Jayarajah, Archan Misra, Rajesh Krishna Balan, "GruMon: Fast and Accurate Group Monitoring for Heterogeneous Urban Spaces," *ACM Sensys*, November 2014 **(Critique required.)**
24. Tadashi Okoshi and Vu Lu, Chetna Vig, Youngki Lee, Rajesh Krishna Balan, and Archan Misra, "QueueVadis: Queuing Analytics using Smartphones," *IEEE/ACM IPSN*, April 2015

No Readings for 2/21 and 2/23. See slides for homework instead.

Readings for 2/28: Early work on Social Media as Sensors

25. Takeshi Sakaki, Makoto Okazaki, and Yutaka Matsuo, "Earthquake Shakes Twitter Users: Real-time Event Detection by Social Sensors," In Proc. *19th international Conference on World Wide Web (WWW)*, April 2010
26. T.H. Silva, P.O.S.V. de Melo, J.M. Almeida, J. Salles, A.A.F. Loureiro "A Picture of Instagram is Worth More Than a Thousand Words: Workload Characterization and Application," In Proc. *Distributed Computing in Sensor Systems (DCoSS)* May 2013
27. Dong Wang, Hieu Le, Lance Kaplan, Tarek Abdelzaher, "On Truth Discovery in Social Sensing: A Maximum Likelihood Estimation Approach," In Proc. *11th ACM/IEEE Conference on Information Processing in Sensor Networks (ACM/IEEE IPSN)*, April 2012

Readings for 3/2: Event Detection and Localization with Twitter.

28. Chao Zhang, Guangyu Zhou, Quan Yuan, Honglei Zhuang, Yu Zheng, Lance Kaplan, Shaowen Wang, and Jiawei Han, "GeoBurst: Real-Time Local Event Detection in Geo-Tagged Tweet Streams," In Proc. *39th International ACM SIGIR conference on Research and Development in Information Retrieval (SIGIR '16)*, July 2016 **(Critique required)**
29. Prasanna Giridhar, Shiguang Wang, Tarek Abdelzaher, Jemin George, Lance Kaplan, Raghu Ganti, "Joint Localization of Events and Sources in Social Networks," In Proc. *International Conference on Distributed Computing in Sensor Systems (DCoSS)*, Fortaleza, Brazil, June 2015
30. Hamed Abdelhaq, Christian Sengstock, and Michael Gertz, "EvenTweet: online localized event detection from twitter," In Proc. *VLDB*, August 2013
31. Shiguang Wang, Prasanna Giridhar, Hongwei Wang, Lance Kaplan, Tien Pham, Aylin Yener, Tarek Abdelzaher, "StoryLine: On Physical Event Demultiplexing and Tracking in Social Spaces," In Proc. *2nd ACM/IEEE International Conference on Internet of Things Design and Implementation*, Pittsburgh, PA, April 2017
32. Prasanna Giridhar, Md Tanvir Amin, Tarek Abdelzaher, Dong Wang, Lance Kaplan, Jemin George, Raghu Ganti, "ClariSense+: An Enhanced Traffic Anomaly Explanation Service Using Social Network Feeds," *Pervasive and Mobile Computing*, December 2016

Readings for 3/7: Event Detection and Localization with Instagram.

33. Prasanna Giridhar, Shiguang Wang, Tarek Abdelzaher, Raghu Ganti, Lance Kaplan, Jemin George, "On Localizing Urban Events with Instagram," In Proc. *IEEE Infocom*, Atlanta, GA, May 2017
34. K. Jayarajah and A. Misra, "Can Instagram posts help characterize urban micro-events?," In Proc. *19th International Conference on Information Fusion (FUSION)*, Heidelberg, Germany, July 2016. **(Critique required)**

35. Prasanna Giridhar, Shiguang Wang, Tarek Abdelzaher, Tanvir Al Amin, Lance Kaplan, “Social Fusion: Integrating Twitter and Instagram for Event Monitoring,” In Proc. *14th IEEE International Conference of Autonomic Computing (ICAC)*, Columbus, OH, July 2017

Readings for 3/9: Veracity Analysis and Data Cleaning.

36. Dong Wang, Tanvir Amin, Shen Li, Tarek Abdelzaher, Lance Kaplan, Siyu Gu, Chenji Pan, Hengchang Liu, Charu Aggrawal, Raghu Ganti, XinLei Wang, Prasant Mohapatra, Boleslaw Szymanski, and Hieu Le, “Humans as Sensors: An Estimation Theoretic Perspective,” In Proc. *13th International Conference on Information Processing in Sensor Networks (ACM/IEEE IPSN)*, Berlin, Germany, April 2014
37. Shuochao Yao, Shaohan Hu, Shen Li, Yiran Zhao, Lu Su, Lance Kaplan, Aylin Yener, Tarek Abdelzaher, “On Source Dependency Models for Reliable Social Sensing: Algorithms and Fundamental Error Bound,” In Proc. *36th International Conference on Distributed Computing Systems (ICDCS)*, Osaka, Japan, June 2016

Readings for 3/14: Veracity Analysis and Data Cleaning (Continued)

38. Md Tanvir A. Amin, Charu Aggarwal, Chuochao Yao, Tarek Abdelzaher, Lance Kaplan, “Unveiling Polarization in Social Networks: A Matrix Factorization Approach,” In Proc. *IEEE Infocom*, Atlanta, GA, May 2017
39. Robin Wentao Ouyang, Lance Kaplan, Paul Martin, Alice Toniolo, Mani Srivastava, and Timothy J. Norman, “Debiasing Crowdsourced Quantitative Characteristics in Local Businesses and Services,” In Proc. *14th International Conference on Information Processing in Sensor Networks (IPSN '15)*, April 2015

Readings for 3/16: Rise of the Internet of Things

40. Stankovic, J.A., “Research Directions for the Internet of Things,” in *IEEE Internet of Things Journal*, vol.1, no.1, pp.3-9, Feb. 2014

Examples of 3/28-3/30: IoT Application Papers

41. Yiran Zhao, Yang Zhang, Tuo Yu, Tianyuan Liu, Xinbing Wang, Xiaohua Tian, Xue Liu, “CityDrive: A Map-generating and Speed-optimizing Driving System," in Proc. *IEEE INFOCOM*, April 2014
42. Fatemeh Saremi, Omid Fatemieh, Hossein Ahmadi, Hongyan Wang, Tarek Abdelzaher, Raghu Ganti, Hengchang Liu, Shaohan Hu, Shen Li, and Lu Su, “Experiences with GreenGPS – Fuel-Efficient Navigation using Participatory Sensing,” *IEEE Transactions on Mobile Computing (IEEE TMC)*, 2016
43. David Hasenfratz, Olga Saukh, Christoph Walser, Christoph Hueglin, Martin Fierz, and Lothar Thiele, “Pushing the Spatio-Temporal Resolution Limit of Urban Air Pollution Maps,” In Proc. *12th International Conference on Pervasive Computing and Communications (PerCom)*, Budapest, Hungary, 2014.
44. Emre Can Kara, Michaelangelo D. Tabone, Jason S. MacDonald, Duncan S. Callaway, and Sila Kiliccote, “Quantifying Flexibility of Residential Thermostatically Controlled Loads for Demand Response: a Data-driven Approach,” In Proceedings of the *1st ACM Conference on Embedded Systems for Energy-Efficient Buildings (BuildSys '14)*, November 2014

Spring Break (3/21-3/23)

Student-led Presentations (4/4, 4/5, 4/11, 4/13)

Papers for 4/18: Big Data Challenges

45. Shuochao Yao, Shaohan Hu, Yiran Zhao, Aston Zhang, Tarek Abdelzaher, "DeepSense: A Unified Deep Learning Framework for Time-Series Mobile Sensing Data Processing," In Proc. International World Wide Web Conference (WWW), Perth, Australia, April 2017.
46. Shuochao Yao, Yiran Zhao, Huajie Shao, Aston Zhang, Chao Zhang, Shen Li, and Tarek Abdelzaher, "RDeepSense: Reliable Deep Mobile Computing Models with Uncertainty Estimation," ACM IMWUT, April 2018.

Papers for 4/20: Deep Learning Challenges

47. Shuochao Yao, Yiran Zhao, Aston Zhang, Lu Su, and Tarek Abdelzaher, "DeepIoT: Compressing Deep Neural Network Structures for Sensing Systems with a Compressor-Critic Framework," In Proc. 15th ACM Conference on Embedded Networked Sensor Systems (ACM SenSys), Delft, The Netherlands, November 2017.
48. Han, Song, Huizi Mao, and William J. Dally. "Deep compression: Compressing deep neural networks with pruning, trained quantization and huffman coding." arXiv preprint arXiv:1510.00149 (2015).

Papers for 4/25: Incentives Challenges

49. Hui Gao, C.H. Liu, Wendong Wang, Jianxin Zhao, Zheng Song, Xin Su, J. Crowcroft, K.K. Leung, "A Survey of Incentive Mechanisms for Participatory Sensing," in *Communications Surveys & Tutorials, IEEE* , vol.17, no.2, pp.918-943, 2015

Papers for 4/27: Trust and Subjective Logic

50. Frederico Cerutti, Lance M. Kaplan, Timothy J. Norman, Nir Oren, Alice Toniolo, “Subjective Logic Operators in Trust Assessment: An Empirical Study,” *Information Systems Frontiers*, Volume 17, Issue 4, August 2015