

Research Publications

Graduate student authors are underlined. Undergraduate student authors are boxed.

Peer Reviewed Journal Articles

- 1 Frey, C., Züfle, A., Emrich, T. & Renz, M. (2018). Efficient information flow maximization in probabilistic graphs. *IEEE Transactions on Knowledge and Data Engineering (Impact Factor: 2.775)*, 30(5), 880–894.
- 2 Frey, C., Züfle, A., Emrich, T. & Renz, M. (2018). Efficient information flow maximization in probabilistic graphs. *IEEE Transactions on Knowledge and Data Engineering*, 30(5), 880–894.
- 3 Truong, R., Gkountouna, O., Pfoser, D. & Züfle, A. (2018). Towards a Better Understanding of Public Transportation Traffic: A Case Study of the Washington, DC Metro. *Urban Science (Impact Factor: Not Available.)* 2(3), 65.
- 4 Jossé, G., Schmid, K. A., Züfle, A., Skoumas, G., Schubert, M., Renz, M., ... Nascimento, M. A. (2017). Knowledge extraction from crowdsourced data for the enrichment of road networks. *GeoInformatica (Impact Factor: 2.091)*, 21(4), 763–795.
- 5 Schmid, K.A., Züfle, A., Emrich, T., Renz, M. & Cheng, R. (2017). Uncertain voronoi cell computation based on space decomposition. *GeoInformatica (Impact Factor: 2.091)*, 21(4), 797–827.
- 6 Emrich, T., Kriegel, H., Kröger, P., Niedermayer, J., Renz, M. & Züfle, A. (2015). On reverse-k-nearest-neighbor joins. *GeoInformatica (Impact Factor: 2.091)*, 19(2), 299–330.
- 7 Schubert, E., Koos, A., Emrich, T., Züfle, A., Schmid, K.A. & Zimek, A. (2015). A framework for clustering uncertain data. *Proceedings of the VLDB Endowment (Impact Factor: N/A. Acceptance Rate: 17%)*, 8(12), 1976–1979.
- 8 Bernecker, T., Cheng, R., Cheung, D. W., Kriegel, H., Lee, S. D., Renz, M., ... Züfle, A. (2013). Model-based probabilistic frequent itemset mining. *Knowledge and Information Systems (KAIS. Impact Factor: 2.247)*, 37(1), 181–217.
- 9 Bernecker, T., Emrich, T., Kriegel, H., Mamoulis, N., Renz, M., Zhang, S. & Züfle, A. (2013). Spatial inverse query processing. *GeoInformatica (Impact Factor: 2.091)*, 17(3), 449–487.
- 10 Niedermayer, J., Züfle, A., Emrich, T., Renz, M., Mamoulis, N., Chen, L. & Kriegel, H. (2013). Probabilistic nearest neighbor queries on uncertain moving object trajectories. *Proceedings of the VLDB Endowment (Impact Factor: N/A. Acceptance Rate: 22.7%)*, 7(3), 205–216.
- 11 Kriegel, H., Renz, M., Schubert, M. & Züfle, A. (2012). Efficient traffic density prediction in road networks using suffix trees. *KI (Künstliche Intelligenz. Impact Factor: N/A)*, 26(3), 233–240.
- 12 Bernecker, T., Emrich, T., Kriegel, H., Renz, M., Zankl, S. & Züfle, A. (2011). Efficient Probabilistic Reverse Nearest Neighbor Query Processing on Uncertain Data. *Proceedings of the VLDB Endowment (Impact Factor: N/A. Acceptance Rate: 18.1%)*, 4(10), 669–680.
- 13 Bernecker, T., Kriegel, H., Mamoulis, N., Renz, M. & Züfle, A. (2010). Scalable probabilistic similarity ranking in uncertain databases. *IEEE Transactions on Knowledge and Data Engineering (Impact Factor: 2.775)*, 22(9), 1234–1246.
- 14 Renz, M., Cheng, R., Kriegel, H., Züfle, A. & Bernecker, T. (2010). Similarity search and mining in uncertain databases. *Proceedings of the VLDB Endowment (Impact Factor N/A. Acceptance Rate: 33%)*, 3(2), 1653–1654.

Peer Reviewed Conference Papers

- 1 Fei, Xiqi, Gkountouna, O., Pfoser, D. & **Züfle, A.** (2019). Spatiotemporal Bus Route Profiling using Odometer Data. In *International ACM Conference on Advances in Geographic Information Systems* (To Appear as Full Paper).
- 2 Kavak, H., Kim, J.-S., Crooks, A., Pfoser, D., Wenk, C. & **Züfle, A.** (2019). Location-Based Social Simulation. In *Proceedings of the 16th International Symposium on Spatial and Temporal Databases* (pp. 218–221).
- 3 Khan, Tunaggina, Kabir, Anowarul, Pfoser, D. & **Züfle, A.** (2019). CrowdZIP: A System to Improve Reverse ZIP Code Geocoding using Spatial and Crowdsourced Data (Demo Paper). In *International ACM Conference on Advances in Geographic Information Systems* (To Appear as Demonstration Paper). ACM.
- 4 Kim, J.-S., Kavak, H., Manzoor, U., Crooks, A., Pfoser, D., Wenk, C. & **Züfle, A.** (2019). Simulating Urban Patterns of Life: A Geo-Social Data Generation Framework (Demo Paper). In *International ACM Conference on Advances in Geographic Information Systems* (To Appear as Demonstration Paper). ACM.
- 5 Kim, J.-S., Kavak, H., Manzoor, U. & **Züfle, A.** (2019). Advancing simulation experimentation capabilities with runtime interventions. In *Proceedings of the Annual Simulation Symposium*. Society for Computer Simulation International.
- 6 Schmid, K. A. & **Züfle, A.** (2019). Representative Query Answers on Uncertain Data. In *Proceedings of the 16th International Symposium on Spatial and Temporal Databases* (pp. 140–149).
- 7 Teng, Xu, Yang, Jingchao, Kim, J.-S., Trajcevski, G., **Züfle, A.** & Nascimento, M. A. (2019). Fine-Grained Diversification of Proximity Constrained Queries on Road Networks. In *Proceedings of the 16th International Symposium on Spatial and Temporal Databases* (pp. 51–60).
- 8 Franzke, M., **Züfle, A.**, Renz, M. & Emrich, T. (2018). Pattern search in temporal social networks. In *Proceedings of the 21th International Conference on Extending Database Technology, EDBT 2018, Vienna, Austria, March 26-29, 2018. (Acceptance Rate: 18.3%)* (pp. 289–300).
- 9 Frey, C., **Züfle, A.**, Emrich, T. & Renz, M. (2018). Efficient Information Flow Maximization in Probabilistic Graphs (Extended Abstract. Acceptance Rate: 18.5%). In *34th IEEE International Conference on Data Engineering, ICDE 2018, Paris, France, April 16-19, 2018* (pp. 1801–1802).
- 10 Snowdon, J., Gkountouna, O., **Züfle, A.** & Pfoser, D. (2018). Spatiotemporal traffic volume estimation model based on GPS samples. In *Proceedings of the Fifth International ACM SIGMOD Workshop on Managing and Mining Enriched Geo-Spatial Data, GeoRich@SIGMOD 2018, Houston, TX, USA, June 15, 2018. (Acceptance Rate: 45%)* (pp. 1–6).
- 11 Teng, X., **Züfle, A.**, Trajcevski, G. & Klabjan, D. (2018). Location-awareness in time series compression. In *European Conference on Advances in Databases and Information Systems (Acceptance Rate: 24.2%)* (pp. 82–95). Springer.
- 12 Gkountouna, O., Pfoser, D., Wenk, C. & **Züfle, A.** (2017). A unified framework to predict movement. In *Advances in Spatial and Temporal Databases - 15th International Symposium, SSTD 2017, Arlington, VA, USA, August 21-23, 2017, Proceedings (Acceptance Rate: 38.4%)* (pp. 393–397).

- 13 Hubig, N., Fengler, P., **Züfle, A.**, Yang, R. & Günemann, S. (2017). Detection and Prediction of Natural Hazards Using Large-Scale Environmental Data. In *Advances in Spatial and Temporal Databases - 15th International Symposium, SSTD 2017, Arlington, VA, USA, August 21-23, 2017, Proceedings (Acceptance Rate: 32.7%)* (pp. 300–316).
- 14 Li, Renee, **Züfle, A.**, Zhao, L. & Lamprianidis, G. (2017). Modeling and prediction of people's needs (vision paper). In *Proceedings of the 1st ACM SIGSPATIAL Workshop on Analytics for Local Events and News (Acceptance Rate: 50%)* (p. 3). ACM.
- 15 Lin, E., Park, J. D. & **Züfle, A.** (2017). Real-time bayesian micro-analysis for metro traffic prediction. In *Proceedings of the 3rd ACM SIGSPATIAL Workshop on Smart Cities and Urban Analytics, Redondo Beach, CA, USA, November 7, 2017 (Acceptance Rate: 25.0%)* (12:1–12:4).
- 16 Park, J. D., Seglem, E., Lin, E. & **Züfle, A.** (2017). Protecting user privacy: Obfuscating discriminative spatio-temporal footprints. In *Proceedings of the 1st ACM SIGSPATIAL Workshop on Recommendations for Location-based Services and Social Networks, LocalRec@SIGSPATIAL 2017, Redondo Beach, CA, USA, November 7-10, 2017. (Acceptance Rate: 60%)* (2:1–2:4).
- 17 Schmid, K.A., **Züfle, A.**, Pfoser, D., Crooks, A., Croitoru, A. & Stefanidis, A. (2017). Predicting the evolution of narratives in social media. In *Advances in Spatial and Temporal Databases - 15th International Symposium, SSTD 2017, Arlington, VA, USA, August 21-23, 2017, Proceedings (Acceptance Rate: 38.4%)* (pp. 388–392).
- 18 Seglem, E., **Züfle, A.**, Stutzki, J., Borutta, F., Faerman, E. & Schubert, M. (2017). On privacy in spatio-temporal data: User identification using microblog data. In *Advances in Spatial and Temporal Databases - 15th International Symposium, SSTD 2017, Arlington, VA, USA, August 21-23, 2017, Proceedings (Acceptance Rate: 32.7%)* (pp. 43–61).
- 19 Sohail, A., Taniar, D., **Züfle, A.** & Park, J. (2017). Query processing in location-based social networks. In *Proceedings of the 26th International Conference on World Wide Web Companion, Perth, Australia, April 3-7, 2017 (Acceptance Rate: 17.0%)* (pp. 1379–1381).
- 20 Yang, G. & **Züfle, A.** (2017). Spatio-temporal prediction of social connections. In *Proceedings of the Fourth International ACM Workshop on Managing and Mining Enriched Geo-Spatial Data, Chicago, IL, USA, May 14, 2017 (Acceptance Rate: 44%)* (6:1–6:6).
- 21 **Züfle, A.**, Trajcevski, G., Pfoser, D., Renz, M., Rice, M. T., Leslie, T., ... Emrich, T. (2017). Handling uncertainty in geo-spatial data. In *33rd IEEE International Conference on Data Engineering, ICDE 2017, San Diego, CA, USA, April 19-22, 2017 (Acceptance Rate: 17.7%)* (pp. 1467–1470).
- 22 Franzke, M., Bleicher, J. & **Züfle, A.** (2016). Finding influencers in temporal social networks using intervention analysis. In *Databases Theory and Applications - 27th Australasian Database Conference, ADC 2016, Sydney, NSW, Australia, September 28-29, 2016, Proceedings (Acceptance Rate: 44%)* (pp. 3–16).
- 23 Franzke, M., Emrich, T., **Züfle, A.** & Renz, M. (2016). Indexing multi-metric data. In *32nd IEEE International Conference on Data Engineering, ICDE 2016, Helsinki, Finland, May 16-20, 2016 (Acceptance Rate: 18%)* (pp. 1122–1133).
- 24 Schmid, K.A., Frey, C., Peng, F., Weiler, M., **Züfle, A.**, Chen, L. & Renz, M. (2016). Trendtracker: Modelling the motion of trends in space and time. In *IEEE International Conference on Data Mining Workshops, ICDM Workshops 2016, December 12-15, 2016, Barcelona, Spain. (Acceptance Rate: 33%)* (pp. 1145–1152).

- 25 Yang, G. & Züfle, A. (2016). Spatio-temporal site recommendation. In *IEEE International Conference on Data Mining Workshops, ICDM Workshops 2016, December 12-15, 2016, Barcelona, Spain. (Acceptance Rate: 33%)* (pp. 1173–1178).
- 26 Emrich, T., Schmid, K.A., Züfle, A., Renz, M. & Cheng, R. (2015). Uncertain voronoi cell computation based on space decomposition. In *Advances in Spatial and Temporal Databases - 14th International Symposium, SSTD 2015, Hong Kong, China, August 26-28, 2015. Proceedings (Acceptance Rate: 37.5%)* (pp. 98–116).
- 27 Jossé, G., Franzke, M., Skoumas, G., Züfle, A., Nascimento, M. A. & Renz, M. (2015). A framework for computation of popular paths from crowdsourced data. In *31st IEEE International Conference on Data Engineering, ICDE 2015, Seoul, South Korea, April 13-17, 2015 (Acceptance Rate: 25%)* (pp. 1428–1431).
- 28 Jossé, G., Schmid, K.A., Züfle, A., Skoumas, G., Schubert, M. & Pfoser, D. (2015). Turismo: A user-preference tourist trip search engine. In *Advances in Spatial and Temporal Databases - 14th International Symposium, SSTD 2015, Hong Kong, China, August 26-28, 2015. Proceedings (Acceptance Rate: 37.5%)* (pp. 514–519).
- 29 Mauder, M., Reisinger, M., Emrich, T., Züfle, A., Renz, M., Trajcevski, G. & Tamassia, R. (2015). Minimal spatio-temporal database repairs. In *Advances in Spatial and Temporal Databases - 14th International Symposium, SSTD 2015, Hong Kong, China, August 26-28, 2015. Proceedings (Acceptance Rate: 37.5%)* (pp. 255–273).
- 30 Skoumas, G., Schmid, K.A., Gregor Jossé, G., Schubert, M., Nascimento, M. A., Züfle, A., ... Pfoser, D. (2015). Knowledge-enriched route computation. In *Advances in Spatial and Temporal Databases - 14th International Symposium, SSTD 2015, Hong Kong, China, August 26-28, 2015. Proceedings (Acceptance Rate: 37.5%)* (pp. 157–176).
- 31 Uskat, D., Emrich, T., Züfle, A., Schmid, K.A., Bernecker, T. & Renz, M. (2015). Similarity search in fuzzy object databases. In *Proceedings of the 27th International Conference on Scientific and Statistical Database Management, SSDBM '15, La Jolla, CA, USA, June 29 - July 1, 2015 (Acceptance Rate: 25%)* (32:1–32:6).
- 32 Weiler, M., Züfle, A., Borutta, F. & Emrich, T. (2015). Socio textual mapping. In *Proceedings of the 8th ACM SIGSPATIAL International Workshop on Location-Based Social Networks, LBSN 2015, Bellevue, WA, USA, November 3-6, 2015 (Acceptance Rate: 33%)* (6:1–6:4).
- 33 Cheng, R., Emrich, T., Kriegel, H., Mamoulis, N., Renz, M., Trajcevski, G. & Züfle, A. (2014). Managing uncertainty in spatial and spatio-temporal data. In *IEEE 30th International Conference on Data Engineering, Chicago, ICDE 2014, IL, USA, March 31 - April 4, 2014 (Acceptance Rate: 25%)* (pp. 1302–1305).
- 34 Emrich, T., Franzke, M., Kriegel, H., Niedermayer, J., Renz, M. & Züfle, A. (2014). An extendable framework for managing uncertain spatio-temporal data. In *International Conference on Management of Data, SIGMOD 2014, Snowbird, UT, USA, June 22-27, 2014 (Acceptance Rate: 25%)* (pp. 1087–1090).
- 35 Emrich, T., Franzke, M., Mamoulis, N., Renz, M. & Züfle, A. (2014). Geo-social skyline queries. In *Database Systems for Advanced Applications - 19th International Conference, DASFAA 2014, Bali, Indonesia, April 21-24, 2014. Proceedings, Part II (Acceptance Rate: 23.4%)* (pp. 77–91).
- 36 Emrich, T., Kriegel, H., Mamoulis, N., Niedermayer, J., Renz, M. & Züfle, A. (2014). Reverse-nearest neighbor queries on uncertain moving object trajectories. In *Database Systems for Advanced Applications - 19th International Conference, DASFAA 2014, Bali, Indonesia, April 21-24, 2014. Proceedings, Part II (Acceptance Rate: 23.4%)* (pp. 92–107).

- 37 Hubig, N., **Züfle, A.**, Emrich, T., Renz, M., Nascimento, M. A. & Kriegel, H. (2014). Monitoring probabilistic threshold SUM query processing in uncertain streams. In *Database Systems for Advanced Applications - 19th International Conference, DASFAA 2014, Bali, Indonesia, April 21-24, 2014. Proceedings, Part I (Acceptance Rate: 23.4%)* (pp. 420–435).
- 38 Skoumas, G., Schmid, K.A., Jossé, G., **Züfle, A.**, Nascimento, M. A., Renz, M. & Pfoser, D. (2014). Towards knowledge-enriched path computation. In *Proceedings of the 22nd ACM SIGSPATIAL International Conference on Advances in Geographic Information Systems, Dallas/Fort Worth, TX, USA, November 4-7, 2014 (Acceptance Rate: 32%)* (pp. 485–488).
- 39 **Züfle, A.**, Emrich, T., Schmid, K.A., Mamoulis, N., Zimek, A. & Renz, M. (2014). Representative clustering of uncertain data. In *The 20th ACM SIGKDD International Conference on Knowledge Discovery and Data Mining, KDD '14, New York, NY, USA - August 24 - 27, 2014 (Acceptance Rate: 15%)* (pp. 243–252).
- 40 Emrich, T., Jossé, G., Kriegel, H., Mauder, M., Niedermayer, J., Renz, M., ... **Züfle, A.** (2013). Optimal distance bounds for the mahalanobis distance. In *Similarity Search and Applications - 6th International Conference, SISAP 2013, A Coruña, Spain, October 2-4, 2013, Proceedings* (pp. 175–181).
- 41 Emrich, T., Kriegel, H., Kröger, P., Niedermayer, J., Renz, M. & **Züfle, A.** (2013). Reverse-k-nearest-neighbor join processing. In *Advances in Spatial and Temporal Databases - 13th International Symposium, SSTD 2013, Munich, Germany, August 21-23, 2013. Proceedings. (Acceptance Rate: 41%)* (pp. 277–294).
- 42 Emrich, T., Kriegel, H., Mauder, M., Renz, M., Trajcevski, G. & **Züfle, A.** (2013). Minimal spatio-temporal database repairs. In *21st SIGSPATIAL International Conference on Advances in Geographic Information Systems, SIGSPATIAL 2013, Orlando, FL, USA, November 5-8, 2013* (pp. 482–485).
- 43 Emrich, T., Kröger, P., Niedermayer, J., Renz, M. & **Züfle, A.** (2013). A mutual pruning approach for rknn join processing. In *Datenbanksysteme für Business, Technologie und Web (BTW), 15. Fachtagung des GI-Fachbereichs "Datenbanken und Informationssysteme" (DBIS), 11.-15.3.2013 in Magdeburg, Germany. Proceedings* (pp. 21–35).
- 44 Niedermayer, J., **Züfle, A.**, Emrich, T., Renz, M., Mamoulis, N., Chen, L. & Kriegel, H. (2013). Similarity search on uncertain spatio-temporal data. In *Similarity Search and Applications - 6th International Conference, SISAP 2013, A Coruña, Spain, October 2-4, 2013, Proceedings (Acceptance Rate: N/A)* (pp. 43–49).
- 45 Zhang, P., Cheng, R., Mamoulis, N., Renz, M., **Züfle, A.**, Tang, Y. & Emrich, T.. (2013). Voronoi-based nearest neighbor search for multi-dimensional uncertain databases. In *29th IEEE International Conference on Data Engineering, ICDE 2013, Brisbane, Australia, April 8-12, 2013* (pp. 158–169).
- 46 Bernecker, T., Emrich, T., Kriegel, H., Renz, M. & **Züfle, A.** (2012). Probabilistic ranking in fuzzy object databases. In *21st ACM International Conference on Information and Knowledge Management, CIKM'12, Maui, HI, USA, October 29 - November 02, 2012* (pp. 2647–2650).
- 47 Bernecker, T., Kriegel, H., Renz, M., Verhein, F. & **Züfle, A.** (2012). Probabilistic frequent pattern growth for itemset mining in uncertain databases. In *Scientific and Statistical Database Management - 24th International Conference, SSDBM 2012, Chania, Crete, Greece, June 25-27, 2012. Proceedings* (pp. 38–55).
- 48 Emrich, T., Kriegel, H., Mamoulis, N., Renz, M. & **Züfle, A.** (2012). Indexing uncertain spatio-temporal data. In *21st ACM International Conference on Information and Knowledge Management, CIKM'12, Maui, HI, USA, October 29 - November 02, 2012* (pp. 395–404).

- 49 Emrich, T., Kriegel, H., Mamoulis, N., Renz, M. & Züfle, A.. (2012). Querying uncertain spatio-temporal data. In *IEEE 28th International Conference on Data Engineering (ICDE 2012)*, Washington, DC, USA (Arlington, Virginia), 1-5 April, 2012 (pp. 354–365).
- 50 Emrich, T., Kriegel, H., Niedermayer, J., Renz, M., Suhartha, A. & Züfle, A.. (2012). Exploration of monte-carlo based probabilistic query processing in uncertain graphs. In *21st ACM International Conference on Information and Knowledge Management, CIKM'12*, Maui, HI, USA, October 29 - November 02, 2012 (pp. 2728–2730).
- 51 Hubig, N., Züfle, A., Emrich, T., Nascimento, M. A., Renz, M. & Kriegel, H. (2012). Continuous probabilistic sum queries in wireless sensor networks with ranges. In *Scientific and Statistical Database Management - 24th International Conference, SSDBM 2012*, Chania, Crete, Greece, June 25-27, 2012. *Proceedings* (pp. 96–105).
- 52 Bernecker, T., Emrich, T., Kriegel, H., Mamoulis, N., Renz, M., Zhang, S. & Züfle, A.. (2011). Inverse queries for multidimensional spaces. In *Advances in Spatial and Temporal Databases - 12th International Symposium, SSTD 2011*, Minneapolis, MN, USA, August 24-26, 2011, *Proceedings* (pp. 330–347).
- 53 Bernecker, T., Emrich, T., Kriegel, H., Mamoulis, N., Renz, M. & Züfle, A.. (2011). A novel probabilistic pruning approach to speed up similarity queries in uncertain databases. In *Proceedings of the 27th International Conference on Data Engineering, ICDE 2011*, April 11-16, 2011, Hannover, Germany (pp. 339–350).
- 54 Bernecker, T., Emrich, T., Kriegel, H., Züfle, A., Chen, L., Lian, X. & Mamoulis, N. (2011). Managing uncertain spatio-temporal data. In *Proceedings of the 2nd ACM SIGSPATIAL International Workshop on Querying and Mining Uncertain Spatio-Temporal Data, QUEST 2011*, Chicago, IL, USA, November 1, 2011 (pp. 16–20).
- 55 Bernecker, T., Kriegel, H., Mamoulis, N., Renz, M. & Züfle, A.. (2011). Continuous inverse ranking queries in uncertain streams. In *Scientific and Statistical Database Management - 23rd International Conference, SSDBM 2011*, Portland, OR, USA, July 20-22, 2011. *Proceedings* (pp. 37–54).
- 56 Emrich, T., Kriegel, H., Kröger, P., Renz, M., Senner, J. & Züfle, A.. (2011). A visual evaluation framework for spatial pruning methods. In *Advances in Spatial and Temporal Databases - 12th International Symposium, SSTD 2011*, Minneapolis, MN, USA, August 24-26, 2011, *Proceedings* (pp. 507–511).
- 57 Follmann, A., Nascimento, M. A., Züfle, A., Renz, M., Kröger, P. & Kriegel, H. (2011). Continuous probabilistic count queries in wireless sensor networks. In *Advances in Spatial and Temporal Databases - 12th International Symposium, SSTD 2011*, Minneapolis, MN, USA, August 24-26, 2011, *Proceedings* (Acceptance Rate: 41 (pp. 279–296).
- 58 Kriegel, H., Schubert, M. & Züfle, A.. (2011). Managing and mining multiplayer online games. In *Advances in Spatial and Temporal Databases - 12th International Symposium, SSTD 2011*, Minneapolis, MN, USA, August 24-26, 2011, *Proceedings* (Acceptance Rate: 38%) (pp. 441–444).
- 59 Emrich, T., Kriegel, H., Kröger, P., Renz, M., Xu, N. & Züfle, A.. (2010). Reverse k-nearest neighbor monitoring on mobile objects. In *18th ACM SIGSPATIAL International Symposium on Advances in Geographic Information Systems, ACM-GIS 2010*, November 3-5, 2010, San Jose, CA, USA, *Proceedings* (pp. 494–497).
- 60 Emrich, T., Kriegel, H., Kröger, P., Renz, M. & Züfle, A.. (2010). Boosting spatial pruning: On optimal pruning of mbrs. In *Proceedings of the ACM SIGMOD International Conference on Management of Data, SIGMOD 2010*, Indianapolis, Indiana, USA, June 6-10, 2010 (pp. 39–50).

- 61 Kawagoe, K., Bernecker, T., Kriegel, H., Renz, M., Zimek, A. & Züfle, A.. (2010). Similarity search in time series of dynamical model-based systems. In *Database and Expert Systems Applications, DEXA, International Workshops, Bilbao, Spain, August 30 - September 3, 2010* (pp. 110–114).
- 62 Achtert, E., Kriegel, H., Kröger, P., Renz, M. & Züfle, A.. (2009). Reverse k-nearest neighbor search in dynamic and general metric databases. In *EDBT 2009, 12th International Conference on Extending Database Technology, Saint Petersburg, Russia, March 24-26, 2009, Proceedings* (pp. 886–897).
- 63 Bernecker, T., Kriegel, H., Renz, M., Verhein, F. & Züfle, A.. (2009). Probabilistic frequent itemset mining in uncertain databases. In *Proceedings of the 15th ACM SIGKDD International Conference on Knowledge Discovery and Data Mining, Paris, France, June 28 - July 1, 2009 (Acceptance Rate: 12%)* (pp. 119–128).
- 64 Bernecker, T., Kriegel, H., Renz, M. & Züfle, A.. (2009). Hot item detection in uncertain data. In *Advances in Knowledge Discovery and Data Mining, 13th Pacific-Asia Conference, PAKDD 2009, Bangkok, Thailand, April 27-30, 2009, Proceedings* (pp. 673–680).
- 65 Bernecker, T., Kriegel, H., Renz, M. & Züfle, A.. (2009). Probabilistic ranking in uncertain vector spaces. In *Database Systems for Advanced Applications, DASFAA 2009 International, Brisbane, Australia, April 20-23, 2009 (acceptance rate: 25%)* (pp. 122–136).
- 66 Emrich, T., Kriegel, H., Kröger, P., Renz, M. & Züfle, A.. (2009). Constrained reverse nearest neighbor search on mobile objects. In *17th ACM SIGSPATIAL International Symposium on Advances in Geographic Information Systems, ACM-GIS 2009, November 4-6, 2009, Seattle, Washington, USA, Proceedings* (pp. 197–206).
- 67 Emrich, T., Kriegel, H., Kröger, P., Renz, M. & Züfle, A.. (2009). Incremental reverse nearest neighbor ranking in vector spaces. In *Advances in Spatial and Temporal Databases, 11th International Symposium, SSTD 2009, Aalborg, Denmark, July 8-10, 2009, Proceedings* (pp. 265–282).
- 68 Kriegel, H., Kröger, P., Renz, M., Züfle, A. & Katzdobler, A.. (2009). Incremental reverse nearest neighbor ranking. In *Proceedings of the 25th International Conference on Data Engineering, ICDE 2009, March 29 2009 - April 2 2009, Shanghai, China* (pp. 1560–1567).
- 69 Kriegel, H., Kröger, P., Renz, M., Züfle, A. & Katzdobler, A.. (2009). Reverse k-nearest neighbor search based on aggregate point access methods. In *Scientific and Statistical Database Management, 21st International Conference, SSDBM 2009, New Orleans, LA, USA, June 2-4, 2009, Proceedings* (pp. 444–460).
- 70 Kriegel, H., Renz, M., Schubert, M. & Züfle, A.. (2008). Statistical density prediction in traffic networks. In *Proceedings of the SIAM International Conference on Data Mining, SDM 2008, April 24-26, 2008, Atlanta, Georgia, USA (acceptance rate: 14.2%)* (pp. 692–703).
- 71 Wang, J., Gao, Y., Züfle, A., Yang, J. & Zhao, L. (Nov. 2018). Incomplete label uncertainty estimation for petition victory prediction with dynamic features. In *IEEE International Conference on Data Mining (ICDM) 2018. (Acceptance Rate: 8.4%) (Accepted. To Appear.)*

Non-Peer Reviewed Published Papers, Editorials and Monographs

- 1 Züfle, A. (2018). Introduction to this special issue: urban analytics and mobility (part 1). In *SIGSPATIAL Special 10(1)*.
- 2 Züfle, A. (2018). Introduction to this special issue: urban analytics and mobility (part 2). In *SIGSPATIAL Special 10(2)*.

- 3 Frey, C., **Züfle, A.**, Emrich, T. & Renz, M. (2017). Efficient Information Flow Maximization in Probabilistic Graphs. Corr/ArXiv.
- 4 **Züfle, A.** (2016). Bayesian network movement model. In SIGSPATIAL Special 8(2), pp. 18–25.
- 5 **Züfle, A.**, Adams, B. & Wu, D. (2016). Proceedings of the Third International ACM SIGMOD Workshop on Managing and Mining Enriched Geo-Spatial Data, GeoRich@SIGMOD 2016, San Francisco, California, USA, June 26 - July 1, 2016.
- 6 Mouratidis, K., Renz, M., Emrich, T., **Züfle, A.** & Janowicz, K. (2015). Second International ACM Workshop on Managing and Mining Enriched Geo-Spatial Data, GeoRich@SIGMOD 2015, Melbourne, VIC, Australia, May 31, 2015.
- 7 Nascimento, M. A., Renz, M., Emrich, T., Mouratidis, K. & **Züfle, A.** (2014). Proceedings of Workshop on Managing and Mining Enriched Geo-Spatial Data, GeoRich@SIGMOD 2014, Snowbird, UT, USA, June 27, 2014.
- 8 Skoumas, G., Schmid, K.A., Jossé, G., **Züfle, A.**, Nascimento, M. A., Renz, M. & Pfoser, D. (2014). Towards Knowledge-Enriched Path Computation. Corr/ArXiv.
- 9 Niedermayer, J., Züfle, A., Emrich, T., Renz, M., Mamoulis, N., Chen, L. & Kriegel, H. (2013). Probabilistic Nearest Neighbor Queries on Uncertain Moving Object Trajectories. Corr/ArXiv.
- 10 Bernecker, T., Emrich, T., Kriegel, H., Mamoulis, N., Renz, M., Zhang, S. & Züfle, A. (2011). Inverse Queries For Multidimensional Spaces. Corr/ArXiv.
- 11 Bernecker, T., Emrich, T., Kriegel, H., Mamoulis, N., Renz, M. & Züfle, A. (2011). A Novel Probabilistic Pruning Approach to Speed Up Similarity Queries in Uncertain Databases. Corr/ArXiv.
- 12 Bernecker, T., Kriegel, H., Mamoulis, N., Renz, M. & Züfle, A. (2009). Scalable Probabilistic Similarity Ranking in Uncertain Databases (Technical Report). Corr/ArXiv.

Sponsored Research Activity

National Science Foundation

Project Title: AitF: Collaborative Research: Modeling movement on transportation networks using uncertain data

GMU Grant: #203981/203982

Award: CCF-1637541

Role: Co-Principal Investigator

Principal Investigator: Pfoser, Dieter

Total Budget Amount: \$507,852

Performance Period: 09/01/2016 - 08/31/2020

Commitment per Year: 1 Summer Month

Proposal Status: Awarded

Project Related Publications

- 1 [Snowdon, J.](#), [Gkountouna, O.](#), [Züfle, A.](#) & [Pfoser, D.](#) (2018). Spatiotemporal traffic volume estimation model based on GPS samples. In *Proceedings of the Fifth International ACM SIGMOD Workshop on Managing and Mining Enriched Geo-Spatial Data, GeoRich@SIGMOD 2018, Houston, TX, USA, June 15, 2018. (Acceptance Rate: 45%)* (pp. 1–6).
- 2 [Truong, R.](#), [Gkountouna, O.](#), [Pfoser, D.](#) & [Züfle, A.](#) (2018). Towards a Better Understanding of Public Transportation Traffic: A Case Study of the Washington, DC Metro. *Urban Science (Impact Factor: Not Available.)* 2(3), 65.
- 3 [Gkountouna, O.](#), [Pfoser, D.](#), [Wenk, C.](#) & [Züfle, A.](#) (2017). A unified framework to predict movement. In *Advances in Spatial and Temporal Databases - 15th International Symposium, SSTD 2017, Arlington, VA, USA, August 21-23, 2017, Proceedings (Acceptance Rate: 38.4%)* (pp. 393–397).
- 4 [Lin, E.](#), [Park, J. D.](#) & [Züfle, A.](#) (2017). Real-time bayesian micro-analysis for metro traffic prediction. In *Proceedings of the 3rd ACM SIGSPATIAL Workshop on Smart Cities and Urban Analytics, Redondo Beach, CA, USA, November 7, 2017 (Acceptance Rate: 25.0%)* (12:1–12:4).
- 5 [Yang, G.](#) & [Züfle, A.](#) (2017). Spatio-temporal prediction of social connections. In *Proceedings of the Fourth International ACM Workshop on Managing and Mining Enriched Geo-Spatial Data, Chicago, IL, USA, May 14, 2017 (Acceptance Rate: 44%)* (6:1–6:6).
- 6 [Züfle, A.](#), [Trajcevski, G.](#), [Pfoser, D.](#), [Renz, M.](#), [Rice, M. T.](#), [Leslie, T.](#), ... [Emrich, T.](#) (2017). Handling uncertainty in geo-spatial data. In *33rd IEEE International Conference on Data Engineering, ICDE 2017, San Diego, CA, USA, April 19-22, 2017 (Acceptance Rate: 17.7%)* (pp. 1467–1470).

Defense Advanced Research Projects Agency (DARPA) Defense Sciences Office

Project Title: A ground-truth simulator for socio-spatial alternate worlds

GMU Grant: #204398

Award: HR00111820005

Role: Principal Investigator

Co-Principal Investigators: Pfoser, Dieter and Crooks, Andrew

Total Budget Amount: \$1,544,290

Performance Period: 12/29/2017- 06/28/2020

Commitment per Year: 2 Summer Months. One Course Equivalent.

Proposal Status: Cooperative Agreement Fully Executed.

Publications on hold as requested by Program Manager.

Conference and Other Scholarly Presentations (since 2016)

- 1 **Züfle, A.** (2019, August 20). Location-Based Social Simulation. Conference presentation at the 16th International Symposium on Spatial and Temporal Databases.
- 2 **Züfle, A.** (2019, August 19). Fine-Grained Diversification of Proximity Constrained Queries on Road Networks. Conference presentation at the 16th International Symposium on Spatial and Temporal Databases.
- 3 **Züfle, A.** (2018, November 7). The SIGSPATIAL Special Newsletter. ACM SIGSPATIAL 2018 Business Meeting. Seattle, WA.
- 4 **Züfle, A.** (2018, November 6). Location-Based Social Simulation: Using Agent-Based Simulation to Simulate Location and Friendship. Keynote Talk at the 1st ACM SIGSPATIAL International Workshop on GeoSpatial Simulation (GeoSim 2018). Seattle, WA.
- 5 **Züfle, A.** (2018, October 19). Spatial Data Science: A Research Overview. Zhejiang Administration of Surveying, Mapping, and Geoinformation, GMU Training Group Presentation. Fairfax, VA.
- 6 **Züfle, A.** (2018, September 26). Spatial Privacy: Challenges and Opportunities. Invited Talk at the IEEE Conference on Privacy Aware Computing during HotPrivacy Day.
- 7 **Züfle, A.** (2018, September 12). Spatial Data Science: A Research Overview. GGS 900: Seminar Presentation. Hosted by Dr. Paul Houser. Fairfax, VA.
- 8 **Züfle, A.** (2018, June 20). A ground-truth simulator for socio-spatial alternate worlds (GT-S3) Homework Presentation. DARPA Ground Truth Review Meeting. Arlington, VA.
- 9 **Züfle, A.** (2018, June 19). A ground-truth simulator for socio-spatial alternate worlds (GT-S3) Project Update and Simulation Demonstration. DARPA Ground Truth Review Meeting. Arlington, VA.
- 10 **Züfle, A.** (2018, June 18). A ground-truth simulator for socio-spatial alternate worlds (GT-S3) Project Update and Simulation Demonstration. DARPA Ground Truth GMU Site Visit. Fairfax, VA.
- 11 **Züfle, A.** (2018, March 13). Artificial Intelligence in Spatial Data Science. Invited talk at the Center for Neural Informatics, Structures, and Plasticity at Krasnow Institute at GMU. Hosted by Dr. Giorgio Ascoli. Fairfax, VA.
- 12 **Züfle, A.** (2018, March 9). Engineering Uncertain Heterogeneous Spatial Data for Traffic Prediction. Invited talk at the Department of Software Engineering at Iowa State University. Hosted by Dr. Goce Trajcevski. Ames, IA.
- 13 **Züfle, A.** (2018, January 19). A ground-truth simulator for socio-spatial alternate worlds (GT-S3) GMU Team Homework Presentation and Project Revision. DARPA Ground Truth Program Kick-Off Meeting. Arlington, VA.
- 14 **Züfle, A.** (2018, January 18). A ground-truth simulator for socio-spatial alternate worlds (GT-S3) Project Presentation. DARPA Ground Truth Program Kick-Off Meeting. Arlington, VA.
- 15 **Züfle, A.** (2017, November 8). The SIGSPATIAL Special Newsletter. ACM SIGSPATIAL 2017 Business Meeting. Redondo Beach, CA.
- 16 **Züfle, A.** (2017, November 7). Protecting User Privacy: Obfuscating Discriminative Spatio-Temporal Footprints. Paper Presentation at the 1st ACM SIGSPATIAL Workshop on Recommendations for Location-based Services and Social Networks (LocalRec 2017), Redondo Beach, CA.

- 17 **Züfle, A.** (2017, November 7). Real-Time Bayesian Micro-Analysis for Metro Traffic Prediction. Paper Presentation at the 3rd ACM SIGSPATIAL Workshop on Smart Cities and Urban Analytics (UrbanGIS 2017), Redondo Beach, CA.
- 18 **Züfle, A.** (2017, August 23). Detection and Prediction of Natural Hazards using Large-Scale Environmental Data. Full paper presentation at the 2017 International Symposium on Spatial and Temporal Databases (SSTD), Arlington, VA.
- 19 **Züfle, A.** (2017, August 22). Predicting the Evolution of Narratives in Social Media. Vision Presentation at the 2017 International Symposium on Spatial and Temporal Databases (SSTD), Arlington, VA.
- 20 **Züfle, A. & Trajcevski, G.** (2017, April 21). Handling Uncertainty in Geo-Spatial Data. Tutorial at the 2017 IEEE International Conference on Data Engineering. San Diego, CA.
- 21 **Züfle, A.** (2016, December 8). The Future of the Geospatial Web. Invited Talk at the Geospatial Platform Workshop. Hosted by GeoPlatform. Washington DC.
- 22 **Züfle, A.** (2016, December 5). Managing Uncertainty in Spatial, Spatio-temporal and Social Media Data. Seminar Presentation at the Department of Computer Science, Hong Kong University, Hong Kong, China.
- 23 **Züfle, A.** (2016, November 16). Big Spatial Data. Presentation at the GMU GIS Day 2016, Fairfax, VA.
- 24 **Züfle, A.** (2016, September 23). Mining Big Spatial Data. GGS 900: Seminar Presentation. Hosted by Dr. Dieter Pfoser. Fairfax, VA.
- 25 **Züfle, A.** (2016, September 15). Mining Big Spatial Data. Zhejiang Administration of Surveying, Mapping, and Geoinformation, GMU Training Group Presentation. Fairfax, VA.