

JOURNAL
PUBLICATIONS

- [1] **M. A. Schuh**, J. M. Banda, T. Wylie, P. McInerney, K. Ganesan Pillai, and R. A. Angryk. On visualization techniques for solar data mining. In: *Astronomy and Computing* (accepted to appear), 2015.
- [2] **M. A. Schuh**, J. M. Banda, P. N. Bernasconi, R. A. Angryk, and P. C. H. Martens. A comparative evaluation of automated solar filament detection. *Solar Physics*, vol. 289 (7), pp. 2503–2524, July 2014.
- [3] **M. Schuh**, J. Sheppard, S. Strasser, R. Angryk, and C. Izurieta. An IEEE standards-based visualization tool for knowledge discovery in maintenance event sequences. *IEEE Aerospace and Electronic Systems Magazine*, vol. 28 (7), pp. 30–39, July 2013.

CONFERENCE &
BOOK CHAPTER
PUBLICATIONS

- [4] J. M. Banda, **M. A. Schuh**, R. A. Angryk, and P. C. H. Martens. Image retrieval on compressed images: Can we tell the difference? In: *4th International Conference on Image Processing Theory, Tools and Applications (IPTA)*, pp. 1–6, IEEE, Oct. 2014.
- [5] **M. A. Schuh** and R. A. Angryk. Massive labeled solar image data benchmarks for automated feature recognition. In: *IEEE International Conference on Big Data (Big Data)*, pp. 53–60, IEEE, Oct. 2014.
- [6] **M. A. Schuh**, T. Wylie, C. Liu, and R. A. Angryk. Approximating high-dimensional range queries with kNN indexing techniques. In: *Computing and Combinatorics, the Proc. of the 20th International Conference (COCOON '14)* (Z. Cai, A. Zelikovskiy, and A. Bourgeois, eds.), vol. 8591 of *Lecture Notes in Computer Science*, pp. 369–380, Springer International Publishing, Aug. 2014.
- [7] **M. A. Schuh**, T. Wylie, and R. A. Angryk. Mitigating the curse of dimensionality for exact kNN retrieval. In: *Proc. of the 27th International Florida Artificial Intelligence Research Society Conference (FLAIRS)*, pp. 363–368, AAAI, May 2014.
- [8] K. Ganesan Pillai, R. Angryk, J. Banda, T. Wylie, and **M. Schuh**. Spatiotemporal co-occurrence rules. In: *New Trends in Databases and Information Systems* (B. Catania, T. Cerquitelli, S. Chiusano, G. Guerrini, M. Kämpf, A. Kemper, B. Novikov, T. Palpanas, J. Pokorný, and A. Vakali, eds.), vol. 241 of *Advances in Intelligent Systems and Computing*, pp. 27–35, Springer International Publishing, 2014.
- [9] J. M. Banda, **M. A. Schuh**, T. Wylie, P. McInerney, and R. A. Angryk. When too similar is bad: A practical example of the solar dynamics observatory content-based image-retrieval system. In: *New Trends in Databases and Information Systems* (B. Catania, T. Cerquitelli, S. Chiusano, G. Guerrini, M. Kämpf, A. Kemper, B. Novikov, T. Palpanas, J. Pokorný, and A. Vakali, eds.), vol. 241 of *Advances in Intelligent Systems and Computing*, pp. 87–95, Springer International Publishing, 2014.
- [10] J. M. Banda, **M. A. Schuh**, R. A. Angryk, K. G. Pillai, and P. McInerney. Big data new frontiers: Mining, search and management of massive repositories of solar image data and solar events. In: *New Trends in Databases and Information Systems* (B. Catania, T. Cerquitelli, S. Chiusano, G. Guerrini, M. Kämpf, A. Kemper, B. Novikov, T. Palpanas, J. Pokorný, and A. Vakali, eds.), vol. 241 of *Advances in Intelligent Systems and Computing*, pp. 151–158, Springer International Publishing, 2014.
- [11] **M. A. Schuh**, R. A. Angryk, K. G. Pillai, J. M. Banda, and P. C. Martens. A large-scale solar image dataset with labeled event regions. In: *Proc. of the 20th IEEE International Conference on Image Processing (ICIP)*, pp. 4349–4353, IEEE, Sept. 2013.

- [12] **M. A. Schuh**, T. Wylie, and R. A. Angryk. Improving the performance of high-dimensional knn retrieval through localized dataspace segmentation and hybrid indexing. In: *Proc. of the 17th East European Conference on Advances in Databases and Information Systems (ADBIS)* (B. Catania, G. Guerrini, and J. Pokorný, eds.), vol. 8133 of *Lecture Notes in Computer Science*, pp. 344–357, Springer Berlin Heidelberg, Sept. 2013.
- [13] **M. A. Schuh**, T. Wylie, J. M. Banda, and R. A. Angryk. A comprehensive study of iDistance partitioning strategies for kNN queries and high-dimensional data indexing. In: *Proc. of the 29th British National Conference on Databases (BNCOD), Big Data* (G. Gottlob, G. Grasso, D. Olteanu, and C. Schallhart, eds.), vol. 7968 of *Lecture Notes in Computer Science*, pp. 238–252, Springer Berlin Heidelberg, July 2013.
- [14] T. Wylie, **M. A. Schuh**, J. W. Sheppard, and R. A. Angryk. Cluster analysis for optimal indexing. In: *Proc. of the 26th International Florida Artificial Intelligence Research Society Conference (FLAIRS)*, pp. 166–171, AAAI, May 2013.
- [15] K. Ganesan Pillai, R. A. Angryk, J. M. Banda, **M. A. Schuh**, and T. Wylie. Spatio-temporal co-occurrence pattern mining in data sets with evolving regions. In: *Proc. of the 12th IEEE International Conference on Data Mining Workshops (ICDMW 12), Workshop on Spatial and SpatioTemporal Data Mining (SSTDM)*, pp. 805–812, IEEE, Dec. 2012.
- [16] P. C. H. Martens, R. A. Angryk, J. M. Banda, K. Ganesan Pillai, and **M. A. Schuh**. Filament and sigmoid statistics gathered by newly developed automated feature finding modules. In: *NSO Workshop #26: Solar Origins of Space Weather and Space Climate: Connecting the Interior to the Corona*, May 2012.
- [17] **M. A. Schuh**, R. A. Angryk, and J. W. Sheppard. Evolving kernel functions with particle swarms and genetic programming. In: *Proc. of the 25th International Florida Artificial Intelligence Research Society Conference (FLAIRS)*, pp. 80–85, AAAI, May 2012.
- [18] **M. Schuh**, J. Sheppard, S. Strasser, R. Angryk, and C. Izurieta. Ontology-guided knowledge discovery of event sequences in maintenance data. In: *Proc. of the IEEE AUTOTESTCON Conference*, pp. 279–285, IEEE, Sept. 2011. **Best Student Paper Award Winner.**
- [19] S. Strasser, J. Sheppard, **M. Schuh**, R. Angryk, and C. Izurieta. Graph-based ontology-guided data mining for d-matrix model maturation. In: *Proc. of the IEEE Aerospace Conference*, pp. 1–12, IEEE, Mar. 2011.
- CONFERENCE POSTERS
- [20] A. Engell, P. Martens, **M. Schuh**, R. Angryk, and G. Gannon. A comprehensive approach to reliable solar flare and solar energetic particle forecasting with results. In: *Space Weather Workshop*, Apr. 2014.
- [21] **M. Schuh**, J. Banda, R. Angryk, and P. Martens. Introducing the first publicly available content-based image-retrieval system for the solar dynamics observatory mission. In: *AAS/SPD Meeting*, vol. 44 of *Solar Physics Division Meeting*, p. #100.97, July 2013.
- [22] **M. Schuh**, J. Banda, R. Angryk, and P. Martens. Evaluating automated solar event detection. In: *Solar Image Processing Workshop (SIPWork) VI*, Aug. 2012.
- [23] **M. Schuh**, J. Banda, P. Bernasconi, R. Angryk, and P. Martens. A comparative evaluation of automated solar filament detection. In: *AAS/SPD Meeting*, vol. 220 of *American Astronomical Society Meeting Abstracts*, p. #201.05, June 2012.
- PAPERS IN PREPARATION
- [24] T. Wylie, **M. A. Schuh**, R. A. Angryk. Enabling high-dimensional range queries using kNN indexing techniques – approaches and empirical results. Invited submission to *Journal of Combinatorial Optimization*.
- [25] **M. A. Schuh**, R. A. Angryk. Optimizations for distance-based indexing for kNN queries in high dimensional spaces – theory and practice. Journal submission.

- [26] **M. A. Schuh**, R. A. Angryk. An efficient and scalable CBIR system based on high-dimensional iDistance indexing to facilitate region-based querying of solar astronomy big data.

GRANT WRITING
EXPERIENCE

- [1] Non-funded contributor. “Systematic Data-Driven Analysis and Tools for Spatiotemporal Solar Astronomy Data”, PI: R. A. Angryk, \$1,499,933, November 2014 – October 2017, NSF, DIBBs Program 2014. Awarded to GSU.
- [2] Co-PI. “A Comprehensive Approach to Reliable Solar Flare Forecasting”, NOAA, SBIR Program, 2013. Not awarded to FF.
- [3] Co-PI. “Research Cluster for Mining Solar Data”, Silicon Mechanics, Research Cluster Grant Program, 2012. Not awarded to MSU.
- [4] Funded contributor. “Large-scale Content-based Image Retrieval System (CBIR) for Interactive Search through the Virtual Solar Observatory (VSO)”, PI: R. A. Angryk, \$1,125,032, August 2011 – July 2015, NASA, EPSCoR Program, 2011. Awarded to MSU.

MORE
INFORMATION

More information and auxiliary documents can be found at
<http://www.cs.montana.edu/~michael.schuh>.