

Bo Kang

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Education

- **Ph.D., Computer Science**
Faculty of Engineering and Architecture, Ghent University, Belgium, 2015 - 2019
- **M.Sc., Computer Science**
Institute of Computer Science, University of Bonn, Germany, 2012 - 2015
Grade: 1.0/1.0, ausgezeichnet
- **B.Eng., Software Engineering**
College of Software Engineering, Sichuan University, China, 2005 - 2009
Grade: 2.3/1.0, gut

Work Experience

- **Ghent University**, Ghent, Belgium, 01/2020 - now.
Postdoc
I am currently involved in multiple projects from the Flanders AI Research (FLAIR) consortium, focusing on topics: AI-assisted data exploration (WP3), trustworthy AI (WP5), industrial use case on public employment services (WP8-T8.3). At the same time, I am leading the implementation of Tijl's ERC PoC project "FEAST". I am also co-advising master and Ph.D. students in various other projects.
- **Ghent University**, Ghent, Belgium, 10/2015 - 12/2019.
Doctoral Student, Advisors: Prof. Tijl De Bie, Dr. Jefrey Lijffijt
I am working on project "FORSIED" - formalizing subjective interestingness in exploratory data mining. My primary interests are data mining and machine learning, and more specifically dimensionality reduction algorithms for visualization.
- **Facebook AI**, New York, United States, 06/2018 - 10/2018.
Research Intern, Advisor: Dr. Darío García García
I was working on a dimensionality reduction method that removes known factors from the lower dimensional representations.
- **University of Bristol**, Bristol, United Kingdom, 06/2015 - 09/2015.
Research Staff, Advisors: Prof. Tijl De Bie, Dr. Jefrey Lijffijt
I worked on project "FORSIED" - formalizing subjective interestingness in exploratory data mining.
- **Fraunhofer IAIS**, Schloss Birlinghoven, Germany, 06/2012 - 05/2015.
Research Assistant, Advisors: Dr. Mario Boley, Dr. Tamas Horvath, Prof. Stefan Wrobel
We investigated co-active learning models and adaptive time-allocation strategies to develop an exploratory data analysis system - "One Click Mining". This project later evolved into two open source projects: realKD and Creed.

- **University of Bonn**, Bonn, Germany, 09/2012 - 12/2012.
Research Assistant, Advisors: David Dröschel, Prof. Sven Behnke
I worked on the visual odometry module of a lightweight quadcopter.

Publications

- Y. Hou, **B. Kang**, W. Van Hauwermeiren, and D. Botteldooren, “Relation-guided acoustic scene classification aided with event embeddings,” in *International Joint Conference on Neural Networks (IJCNN)*, 2022
- Y. Hou, Z. L. **B. Kang**, Y. Wang, and D. Botteldooren, “CT-SAT: Contextual Transformer for Sequential Audio Tagging,” in *Annual Conference of the International Speech Communication Association (INTERSPEECH)*, 2022
- E. Heiter, **B. Kang**, T. De Bie, and J. Lijffijt, “Evaluating Representation Learning and Graph Layout Methods for Visualization,” in *IEEE Computer Graphics and Applications*, 2022
- R. Romero, **B. Kang**, and T. De Bie, “Graph-Survival: A Survival Analysis Framework for Machine Learning on Temporal Network,” in *arXiv*, 2022
- R. Vandaele, **B. Kang**, J. Lijffijt, T. De Bie, and Y. Saeys, “Topologically Regularized Data Embeddings,” in *International Conference on Learning Representations (ICLR)*, 2021
- R. Vandaele, **B. Kang**, T. De Bie, and Y. Saeys, “The Curse Revisited: a Newly Quantified Concept of Meaningful Distances for Learning from High-Dimensional Noisy Data,” in *International Conference on Artificial Intelligence and Statistics (AISTATS)*, 2021
- X. Vankwikelberge, **B. Kang**, E. Heiter, and J. Lijffijt, “ExClus: Explainable Clustering on Low-dimensional Data Representations,” in *Joint AI and ML conference for Belgium, Netherlands and Luxembourg (BNAIC/BeneLearn)*, 2021
- A. Mel, **B. Kang**, J. Lijffijt, and T. D. Bie, “Fondue: a framework for node disambiguation and deduplication using network embeddings,” *Applied Sciences*, 2021
- M. Yoosof, **B. Kang**, J. Lijffijt, and T. De Bie, “Quantifying and reducing imbalance in networks,” *The ACM RecSys Workshop on Recommender Systems for Human Resources (RecSys in HR)*, 2021
- X. Chen, **B. Kang**, J. Lijffijt, and T. De Bie, “Adversarial robustness of probabilistic network embedding for link prediction,” *Proceedings of the 3rd ECML-PKDD Workshop on Machine Learning for Cybersecurity (MLCS)*, 2021
- **B. Kang**, J. Lijffijt, and T. De Bie, “Explanations for network embedding-based link predictions,” *Proceedings of the 3rd ECML-PKDD Workshop on eXplainable Knowledge Discovery in Data Mining (XKDD)*, 2021
- M. Yoosof, **B. Kang**, J. Lijffijt, and T. De Bie, “Quantifying and reducing imbalance in networks,” *The 1st ECML-PKDD Workshop on Fair, Effective And Sustainable Talent management using data science (FEAST)*, 2021
- X. Chen, **B. Kang**, J. Lijffijt, and T. De Bie, “Alpine: active link prediction using network embedding,” *Applied Sciences*, 2021
- **B. Kang**, D. García García, J. Lijffijt, R. Santos-Rodríguez, and T. De Bie, “Conditional t-SNE: more informative t-SNE embeddings,” *Machine Learning*, 2021

- T. De Bie, **B. Kang**, and J. Lijffijt, “Network embedding method,” *US Patent*, 2020
- J. Deng, **B. Kang**, J. Lijffijt, and T. De Bie, “Mining explainable local and global subgraph patterns with surprising densities,” *Data Mining and Knowledge Discovery*, 2020
- A. Mel, **B. Kang**, J. Lijffijt, and T. De Bie, “FONDUE: A framework for node disambiguation using network embeddings,” *International Conference on Data Science and Advanced Analytics (DSAA)*, 2020
- J. Deng, **B. Kang**, J. Lijffijt, and T. De Bie, “Explainable subgraphs with surprising densities: a subgroup discovery approach,” in *SIAM International Conference on Data Mining (SDM)*, 2020
- **B. Kang**, “Learning subjectively interesting data representations,” *Faculty of Engineering and Architecture, Ghent University*, 2019
- J. Deng, J. Lijffijt, **B. Kang**, and T. De Bie, “SIMIT: subjectively interesting motifs in time series,” *Entropy*, vol. 21, no. 6, 2019
- J. Deng, **B. Kang**, J. Lijffijt, and T. De Bie, “Explainable subgraphs with surprising densities: a subgroup discovery approach,” in *15th ACM SIGKDD Workshop on Mining and Learning with Graphs (MLG)*, 2019
- **B. Kang**, K. Puolamäki, J. Lijffijt, and T. De Bie, “A constrained randomization approach to interactive visual data exploration with subjective feedback,” *IEEE Transactions on Knowledge and Data Engineering (TKDE)*, 2019
- K. Puolamäki, E. Oikarinen, **B. Kang**, J. Lijffijt, and T. De Bie, “Interactive visual data exploration with subjective feedback: an information-theoretic approach,” *Data Mining and Knowledge Discovery*, 2019
- **B. Kang**, J. Lijffijt, and T. De Bie, “Conditional Network Embeddings,” in *International Conference on Learning Representations (ICLR)*, 2019
- J. Deng, J. Lijffijt, **B. Kang**, and T. De Bie, “Subjectively interesting motifs in time series,” in *3rd ECML-PKDD Workshop on Advanced Analytics and Learning on Temporal Data*, 2018
- **B. Kang**, J. Lijffijt, R. Santos-Rodríguez, and T. De Bie, “SICA: Subjectively interesting component analysis,” *Data Mining and Knowledge Discovery*, vol. 32, no. 4, pp. 949–987, 2018
- J. Lijffijt, **B. Kang**, W. Duivesteijn, K. Puolamäki, E. Oikarinen, and T. De Bie, “Subjectively interesting subgroup discovery on real-valued targets,” in *Proceedings of the 34th IEEE International Conference on Data Engineering*, 2018
- K. Puolamäki, E. Oikarinen, **B. Kang**, J. Lijffijt, and T. De Bie, “Interactive visual data exploration with subjective feedback: An information-theoretic approach,” in *Proceedings of the 34th IEEE International Conference on Data Engineering*, 2018
- **B. Kang**, J. Deng, J. Lijffijt, and T. De Bie, “Clipped projections for more informative visualizations [a work-in-progress report],” in *Proceedings of the 34th ACM SIGKDD Workshop on Interactive Data Exploration and Analytics (IDEA)*, 2017
- K. Puolamäki, **B. Kang**, J. Lijffijt, and T. De Bie, “Interactive visual data exploration with subjective feedback,” in *Machine Learning and Knowledge Discovery in Databases: European Conference, ECML-PKDD 2016, Riva del Garda, Italy, September 19-23, 2016, Proceedings, Part II*. Springer International Publishing, 2016, pp. 214–229

- **B. Kang**, K. Puolamäki, J. Lijffijt, and T. De Bie, “A tool for subjective and interactive visual data exploration,” in *Machine Learning and Knowledge Discovery in Databases: European Conference, ECML-PKDD 2016, Riva del Garda, Italy, September 19-23, 2016, Proceedings, Part III*. Springer International Publishing, 2016, pp. 3–7
- **B. Kang**, J. Lijffijt, R. Santos-Rodríguez, and T. De Bie, “Subjectively interesting component analysis: Data projections that contrast with prior expectations,” in *Proceedings of the 22nd ACM SIGKDD International Conference on Knowledge Discovery and Data Mining*. ACM, 2016, pp. 1615–1624
- J. Lijffijt, **B. Kang**, K. Puolamäki, and T. De Bie, “SIDE: A web app for interactive visual data exploration with subjective feedback,” in *Proceedings of the 22nd ACM SIGKDD Workshop on Interactive Data Exploration and Analytics (IDEA)*, 2016
- T. De Bie, J. Lijffijt, R. Santos-Rodríguez, and **B. Kang**, “Informative data projections: A framework and two examples,” in *European Symposium on Artificial Neural Networks (ESANN)*, 2016
- J. Lijffijt, E. Spyropoulou, **B. Kang**, and T. De Bie, “P-N-RMiner: A generic framework for mining interesting structured relational patterns,” *International Journal of Data Science and Analytics*, 2016
- J. Lijffijt, E. Spyropoulou, **B. Kang**, and T. De Bie, “P-N-RMiner: A generic framework for mining interesting structured relational patterns,” in *IEEE International Conference on Data Science and Advanced Analytics (DSAA)*, 2015
- M. Boley, M. Krause-Traudes, **B. Kang**, and B. Jacobs, “Creedo-Scalable and repeatable extrinsic evaluation for pattern discovery systems by online user studies,” in *Proceedings of the 21st ACM SIGKDD Workshop on Interactive Data Exploration and Analytics (IDEA)*, 2015, pp. 20–28
- **B. Kang**, “A framework of quantifying subjective unexpectedness of pattern measurements,” *Institute of Computer Science*, 2015
- M. Boley, M. Mampaey, **B. Kang**, P. Tokmakov, and S. Wrobel, “One Click Mining: Interactive local pattern discovery through implicit preference and performance learning,” in *Proceedings of the 19th ACM SIGKDD Workshop on Interactive Data Exploration and Analytics (IDEA)*, 2013, pp. 27–35

Talks and Posters

- **B. Kang**, Talk” “UGent @Work Symposium”, *A recommender system deployed on VDAB data*, Ghent University, 2021.
- **B. Kang**, Talk” “Subjectively Interesting Data Representations”, *Research Seminar of the TUW RU Machine Learning*, TU Wien, 2021.
- **B. Kang**, Talk: “A Recommender Platform Deployed on VDAB Data”, *FLAIR WP8-T8.3 Workshop*, Ghent, 2021.
- **B. Kang**, Talk: “Conditional Network Embeddings”, *BNAIC19 & Benelearn19*, Brussels, 2019.
- **B. Kang**, Talk: “Conditional t-SNE”, *Tufts University*, United States, 2018.
- **B. Kang**, D. Cashman, R. Chang, J. Lijffijt, and T. De Bie, Poster: “CLIPPR: Maximally Informative CLIPped PROjections with Bounding Regions”, in *Proceedings of the IEEE VIS*, 2018.

- **B. Kang**, J. Lijffijt, R. Santos-Rodríguez, T. De Bie, Poster: “A graph based approach for formalizing subjective interestingness of data projections”, *The 14th International Symposium on Intelligent Data Analysis (IDA)*, 2015.
- **B. Kang**, Talk: “One click mining: Interactive local pattern discovery through implicit preference and performance learning”, *Advanced Database Research and Modeling Group*, University of Antwerp, Belgium, 2013.

Teaching Experiences

- Ghent University, Spring Semester 2016, 2017, 2018, 2019, 2020, 2021
Teaching Assistant, I am supervising the laboratory classes of the *Big Data Science* lecture and *AI Research Seminar*.
- University of Bonn, Summer Semester 2014
Teaching Assistant, I was giving the exercises of the *Data Mining* lecture.
- University of Bonn, Winter Semester 2013
Teaching Assistant, I was giving the exercises of the *Machine Learning* lecture.
- University of Bonn, Summer Semester 2013
Teaching Assistant, I was correcting the assignments of the *Data Mining* lecture.

Awards

- IBM Innovation Award, 2020.
- International Conference on Learning Representations (ICLR) Travel Award, 2019.

Community Services

Organisation of conferences, workshops

- Co-chair. ECML-PKDD Workshop on Fair, Effective and Sustainable Talent Management Using Data Science (FEAST 2022), Grenoble, France.
- Co-chair. ECML-PKDD Workshop on Fair, Effective and Sustainable Talent Management Using Data Science (FEAST 2021), Virtual, Spain.
- Co-chair. ECML-PKDD Workshop on Graph Embedding and Mining (GEM 2021), Virtual, Spain.
- Web chair, Virtual conference co-chair. European Conference of Machine Learning and Principles and Practices of Knowledge Discovery in Databases (ECML-PKDD 2020), Ghent, Belgium.
- Co-chair. ECML-PKDD Workshop on Graph Embedding and Mining (GEM 2020), Ghent, Belgium.
- Co-chair. ECML-PKDD Workshop on Graph Embedding and Mining (GEM 2019), Würzburg, Germany.

Reviewer for journals

- Machine Learning Journal (MLJ)
- IEEE Transactions on Knowledge and Data Engineering (TKDE)
- IEEE Transactions on Big Data (BigData)

Program committee member for conferences and workshops

- *European Conference of Machine Learning and Principles and Practices of Knowledge Discovery in Databases* (ECML-PKDD), 2016, 2017, 2018, 2019, 2020, 2021, 2022.
- *Neural Information Processing Systems* (NeurIPS), 2022.
- *ACM International Conference on Web Search and Data Mining* (WSDM), 2022.
- *Learning on Graphs Conference* (LoG), 2022.
- *IEEE Visualization Conference* (VIS), 2022.
- *International Conference on Machine Learning* (ICML), 2022.
- *ACM Special Interest Group on Knowledge Discovery and Data Mining* (SIGKDD), 2022.
- *International Symposium on Intelligent Data Analysis*, 2022.
- *ACM RecSys Workshop on Recommender Systems for Human Resources* (RecSys in HR), 2021, 2022.
- *The Web Conference* (WWW), 2021, 2022.
- *SIAM International Conference on Data Mining* (SDM), 2021, 2022.
- *International Joint Conference on Artificial Intelligence* (IJCAI), 2020.
- *European Conference on Artificial Intelligence* (ECAI), 2020.
- *ACM SIGKDD Workshop on Interactive Data Exploration and Analytics* (IDEA), 2017, 2018.
- *International Conference on Discovery Science* (DS), 2018.
- *Computer Science Conference for University of Bonn Students* (CSCUBS), 2014, 2015.

Thesis committee member

- Xander Vankwikelberge, “ExClus: Explainable Clustering on Low-dimensional Data Representations”, Master of Computer Science Engineering, Ghent University, 2021.
- Robin Vandaele, “Topological Inference in Graphs and Images”, Doctor of Computer Science Engineering, Ghent University, 2020.

Skills

- Programming Languages: Python, Javascript, Java, Scheme. Matlab, C/C++, Shell, L^AT_EX.
- Tools: Amazon AWS, PyTorch, TensorFlow, Spark, Kafka, Redis, Docker, MLFlow, Metaflow, Elastic Stack, Vue.js, React, D3.js, Dash Plotly.
- Natural Languages: Chinese (native), English (fluent), German (intermediate level), Dutch (beginner level), Japanese (beginner level).