Curriculum Vitae of Mr. TIAN,Zonglin

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Education

- Utrecht University, *world universities ranking ARWU49/THE75/QS110;*   2019.11-2023.11
  Department of Information and Computing Sciences;
  Degree: Ph.D. in Visual Analytics;
  Supervisor: Prof. Alexandru C. Telea;
  Research Area: Effective multidimensional projections.

- Northeastern University, *national key university of Program 985;*   2016.9-2019.6
  School of Computer Science and Engineering;
  Degree: Master of Engineering;
  Supervisor: Prof. Yubin Bao;
  Research Area: Bigdata Analysis, Information Visualization.

- Huazhong Agricultural University, *national key university of Project 211;*   2012.9-2016.6
  College of Informatics; Major: Computer Science and Technology;
  Degree: Bachelor of Engineering;
  Supervisor: A/Prof. Jianxiao Liu;
  Research Area: Bioinformatics, Data Mining.

Technical Skills

General Programming Language (Java, Scala)
Web development framework (SpringBoot, SSM), Front-end (JavaScript)
Hadoop, Spark/GraphX, Cluster Management, General Database (Oracle, MySQL)
Now working with NVIDIA & CUDA using C++/Rust/OpenGL.

Publications / Alias. Tian Z

- **Tian Z**, Zhai X, van Steenpaal G, et al. Quantitative and Qualitative Comparison of 2D and 3D Projection Techniques for High-Dimensional Data[J]. Information, 2021, 12(6): 239.
  DOI: 10.3390/info12060239

- **Tian Z**, Zhai X, van Driel D, et al. Using multiple attribute-based explanations of multidimensional projections to explore high-dimensional data[J]. Computers & Graphics, 2021, 98: 93-104.
  DOI: 10.1016/j.cag.2021.04.034

- van Driel D, Zhai X, **Tian Z**, et al. Enhanced Attribute-Based Explanations of Multidimensional Projections[C]// EuroVA@ Eurographics/EuroVis. 2020: 37-41.
  DOI: 10.2312/eurova.20201084

- Liu J, **Tian Z**, Xiao Y, Liu H, Yan J, et al. Gene Regulatory Relationship Mining Using Improved Three-Phase Dependency Analysis Approach[J]. IEEE/ACM Transactions on Computational Biology & Bioinformatics.
  DOI: 10.1109/TCBB.2018.2872993

- Liu J, **Tian Z**, Liu Y, et al. Research of Web Service Recommendation Using Bayesian Network Reasoning[C]// International Conference on Services Computing. Springer, Cham, 2018:19-35.
  DOI: 10.1007/978-3-319-94376-3_2

- Liu J, Tian Z. Verification of Three-Phase Dependency Analysis Bayesian Network Learning Method for Maize Carotenoid Gene Mining[J]. Biomed Research International, 2017, 2017(8):1-10.
  DOI: 10.1155/2017/1813494, IF=2.58

- Liu J, **Tian Z**, Liu P, et al. An Approach of Semantic Web Service Classification Based on Naive Bayes[C]// IEEE International Conference on Services Computing. IEEE, 2016:356-362.
  DOI: 10.1109/SCC.2016.53

- Liu H, Wang F, Xiao Y, **Tian Z**, Wen W, & Zhang X, et al. MODEM: multi-omics data envelopment

and mining in maize[J]// Database the Journal of Biological Databases & Curation, 2016, 2016:baw117.
DOI: 10.1093/database/baw117, IF=3.51

- Liu J, Ning D, Xing K, **Tian Z**, Liu P, & Liu F. Web Service Aggregation Platform Implementation Based on Join Operation[C]// International Conference on Advances in Mechanical Engineering and Industrial Informatics. 2015.
DOI: 10.2991/ameii-15.2015.208

- Liu J, Feng Z, **Tian Z**, et al. Research on Service Organization Based on Decorator Pattern[M]// Collabora- tive Computing: Networking, Applications, and Worksharing. Springer International Publishing, 2015..
DOI: 10.1007/978-3-319-28910-6_9

Patent & Software Copyright

- Liu J, Xiang Y, **Tian Z**, Hao S, Zhang X "Interactive relation method for digging between a kind of gene based on Bayesian Network Inference." CN. Patent CN109411023A, issued March 1, 2019.
Patents: CN109411023A

- Liu J, Liu H, Wang F, **Tian Z**, Yan J, "Platform of Multi-omics data envelopment and mining in maize." CN. Software Copyright 2017SR128806, issued April 20, 2017.
Software Copyright: 2017SR128806

- **Tian Z**, "Novel practical desk." CN. Patent 203873273U, issued October 15, 2014.
Patents: CN203873273U

Research & Engineering Experiences

- Effective Multidimensional Projections for Understanding High-dim Data   *2019.11 - 2023*
Multi/High-dimensional data is a very important type of data since it covers almost every kind of dataset. Researchers already have a lot of experience dealing with these datasets, but in the age of big data, the expansion of the number of dimensionalities (columns) is already made it big trouble for people to handle them. Nowadays, there is a huge amount of methods to reduce the dimensionality of data. The basic idea is to compute the importance of different dimensions and preserve the principle dimensionalities (PCA). If dimensionality is reduced to 2 or 3, then we can understand them, because it's easy to show them in 2D or 3D space. But the problem is the losing details could play a big role in the process of our understanding. How to find these insight messages or how to evaluate the result of dimensionality reduction has become a key problem. In other words, giving good explanations for these results is the final aim that we want to reach. With extra interactions, some methods could let people have global explanations by adding axes to the 2/3D spaces. But they can't give much more local explanations, meanwhile, the existing methods that have local explanations are all heavily dependent on interactions. Thus, we introduced the image-based method to compute the local explanations. It allows users to get local explanations and could complete the computation at one time without extra interaction. We designed three models to compute the local information and finally created six methods to test. We used more than 20 datasets to test every method and gave detailed illustrations to these explanations we get. Using the intrinsic structure we have known, we verified the effectiveness of our explanations. The project is financially supported by the China Scholarship Council.

  Research Advisor: Prof. Alexandru C. Telea

- Visualization of Large-scale Social Network Data   *2017.9-2019.5*
We want to design a rapid, efficient and comprehensible visualization solution for large-scale social network data. In order to adapt to the data size, GraphX was used to calculation; therefore, the force-directed layout algorithm was redesigned to match Spark's running mechanism. In addition, we tried to accelerate the visualization process of data through strategies such as layering, sample and window movement. This process is still being designed and optimized. The project is financially supported by the *National Natural Science Foundation of China, No. 61602103*.

  Research Advisor: Prof. Yubin Bao, Lecturer. F.L. Leng

- Genetic Mining Method Based on TPDA and Its Application   *2017.4-2018.9*
We improved the Three-Phase Dependency Analysis algorithm to rebuild the regulatory relationships of genes, and made a lot of comparison experiments with other eight existing algorithms. Eventually we applied it to the genetic analysis of maize and carotenoid. This research is supported by the *National Natural Science Foundation of China, No. 31601078*.

Research Advisor: [A/Prof. Jianxiao Liu](#)

- Sub-system of Liaoning Fishery Data Center Construction   *2017.4-2018.5*

  The purpose of this project is to build a big data platform of data integration. I was in charge of the data collection of whole system, including the acquisition and decoding of AIS/BDS real-time location information, database design, data distribution and integration management. At the start of the project, I also researched the solution of real-time big data processing, and finally built a small distributed system with about three components (Flume and Kafka/ Storm/ Hbase or Redis). Above projects are commissioned by the *Department of Ocean and Fisheries of Liaoning Province, P.R.China.*

  Engineering Research Advisor: [Prof. Ge Yu](#)

- Water Environmental Protection Management System   *2017.3-2017.9*

  The whole project includes three parts: data management, GIS interaction and data visualization. The first part is similar to the traditional CRUD management system, while the second part is based on ArcGIS. The final system adopts the SSM framework, which can provide efficient and stable data management and visualization. The project is commissioned by the *Department of Envorimental Protection of Liaoning Province, P.R.China.*

  Engineering Research Advisor: [Prof. Yubin Bao](#)

- Research on Web Service Technology for Data Mining and Analysis of Maize   *2014.3-2015.8*

  We established a platform called 'MODEM' which includes a database of maize multidimensional histology and the corresponding analysis tools. This project involves about database query, gene analysis and data interaction. In this project, we also developed a website (MaizeMeeting) for the first maize biology seminar of China. Above projects are financially supported by *Innovation Training Plan of University Student (ITPUS), No. 201410504064.*

  Research Advisor: [A/Prof. Jianxiao Liu](#)

Network

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- ORCID: orcid.org/0000-0001-5626-402X

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