Dong **Sun**

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Summary

I'm now a fourth-year PhD student from the Department of Computer Science and Engineering, the Hong Kong University of Science and Technology. I will graduate this summer. I'm supervised by Prof. Huamin Qu and Prof. Ting-Chuen Pong. I received a Bachelor's Degree in the College of Computer Science and Technology, Zhejiang University in 2017. My research focuses on big data analytics, data visualization, explainable machine learning, automated machine learning, and human-computer interaction.

Education

The Hong Kong University of Science and Technology   *Kowloon, Hong Kong*

PhD in Department of Computer Science and Engineering   *Aug. 2017 -*

- My research focuses on data visualization in smart manufacturing and Industry 4.0, automated machine learning, human-computer interaction, and explainable machine learning.

Zhejiang University   *Hangzhou, China*

Bachelor in the College of Computer Science and Technology   *Sep. 2013 - Jun. 2017*

- My research focuses on realistic rendering and data visualization.

Publications

DFSeer: A Visual Analytics Approach to Facilitate Model Selection for Demand Forecasting

Dong Sun, Zezheng Feng, Yuanzhe Chen, Yong Wang, Jia Zeng, Mingxuan Yuan, Ting-Chuen Pong, and Huamin Qu

ACM CHI Conference on Human Factors in Computing Systems 2020

PlanningVis: A Visual Analytics Approach to Production Planning in Smart Factories

Dong Sun, Renfei Huang, Yuanzhe Chen, Yong Wang, Jia Zeng, Mingxuan Yuan, Ting-Chuen Pong, and Huamin Qu

IEEE Transcactions on Visualization and Computer Graphics 2019 (Proceedings of VAST 2019)

There are also two papers being reviewed by IEEE TVCG and IEEE VIS 2021 respectively.

Projects

Visual Analysis of Product Packing and Dismantling   *HKUST*

I'm the project leader. My responsibility is to coordinate the collaboration between HKUST and Huawei Noah's Ark Lab and develop a visual analytics approach for product packing and dismantling. The proposed visual analytics system supports the exploration, inspection and diagnosis of hierarchical product packing and dismantling. It can reveal when and where the product packing and dismantling   *Oct. 2020 - Mar. 2021* constraint is not satisfied, why the constraint is not satisfied, and how the product packing and dismantling strategy is adjusted to meet the constraint. Also, it enables the comparison between different product packing and dismantling strategies.

Interpretable Product Demand Forecasting (2nd Phase)   *HKUST*

I'm the project leader. My responsibility is to coordinate the collaboration between HKUST and Huawei Noah's Ark Lab and develop a visual analytics system to explain the complex product demand forecasting model. The proposed approach employs a rule list (A rule can be expressed as follows: if the historical product demand satisfies Condition A, then the future product demand will follow Condition B) to simulate   *Apr. 2020 - Apr. 2021* and explain the behavior of the complex product demand forecasting model. It allows interactively adjusting the features to be used in the forecast and explanation, reveals how the rule list is derived, presents different details of the rules, and uncovers whether the rule list is reliable or not. The visualization system can facilitate the understanding, utilizing and diagnosing of product demand forecasting models.

Interpretable Product Demand Forecasting (1st Phase)

HKUST

I'm the project leader. My responsibility is to coordinate the collaboration between HKUST and Huawei Noah's Ark Lab and develop a visual analytics system to uncover how the properties of historical product demand influence the performance of product demand forecasting models. The proposed approach provides a model-agnostic interpretation for product demand forecasting models by revealing the relationship between the properties of the input data (i.e., time series data) and the performance of models. What's more, it presents the similarity between the historical demand of different products, thus helping users visually perceive the semantic meaning of the historical data. The proposed approach can help demand analysts understand, compare, and select product demand forecasting models. Also, the visualization system can increase the confidence of users in the selected model, and help the users utilize their domain knowledge to analyze the model.

Sep. 2019 - Apr. 2020

Visual Analysis of the Comparison and Selection of Product Demand Forecasting Models

HKUST

I'm the project leader. My responsibility is to coordinate the collaboration between HKUST and Huawei Noah's Ark Lab and develop a visual analytics system to enable the exploration, comparison and selection of product demand forecasting models. The system employs a novel workflow to support model selection, which compares and ranks product demand forecasting models based on their performance on the products with similar historical demand data. It provides levels of details to visualize the difference in model performance on the similar products. The proposed method provides transparency and reliability for model selection, which can identify the best model for most products. In addition, by revealing the properties of the historical demand and the model performance on the products with similar historical data, it can reveal the risk of applying a demand forecasting model, thus increasing the confidence of users in the selected model.

Apr. 2019 - Jan. 2020

Visual Analysis of Production Planning

HKUST

I'm the project leader. My responsibility is to coordinate the collaboration between HKUST and Huawei Noah's Ark Lab and develop a visual analytics system to support the exploration and diagnosis of large-scale production planning. Our approach provides levels of details to support the exploration of the relationship between supply and demand, the daily production, the resource consumption, and the dependency between products. The visualization system can reveal potential problems and the bottleneck of a production plan, thus providing guidance for optimizing the plan.

Jun. 2018 - Apr. 2019

Theme-based Project: Digital Citizenship Serious Games

HKUST

I'm the project leader. My responsibility is to coordinate the collaboration between HKUST and HKU, develop the educational serious games, and propose a visual analytics approach to analyze the data collected in the games. In the games, a girl is suffering from cyberbullying. The players are required to complete tasks/quests (e.g., playing the music, the jigsaw, asking someone for help, and so on) collaboratively to help the girl. The design of the game is based on Unity and KBEngine. The game can be run on both mobile phones (both Android and iOS) and computers (both Windows and macOS). Pilot studies were conducted at five primary schools at Hong Kong. We are also developing visual analytics techniques for analyzing the data collected in the pilot studies. The educational serious games can facilitate the education of children (e.g., collaboration, problem solving, dealing with cyberbullying, and so on). The analysis of the data can reveal how students play the games, what they can learn from the games, how they learn from the games, and how effective the learning is. It can also help designers evaluate the games and improve the design of the games.

Sep. 2017 -

Foshan Kamfu Tax Project

HKUST

We collaborate with Foshan Kamfu on this project. My responsibility is to develop the algorithm and visualization system to analyze the satisfaction of customers in the process of tax declaration. I'm also working on proposing a novel algorithm and visualization approach to schedule tax staff. Through the analysis of the satisfaction of customers, we can optimize the service and process of tax declaration to improve the satisfaction. The automatic and visualization approaches for scheduling tax staff aim to optimize the scheduling and increase the work efficiency. The project targets at the intelligent tax declaration and the unattended service.

Mar. 2020 -

E-Learning Project (2nd Phase)

HKUST

We collaborate with TrumpTech on this project. My responsibility is to propose a visualization approach to analyze how students interact with the website when they are answering math questions on the Internet, recommend math questions for students through data-driven approaches, and predict the possibility that students answer a question correctly. By revealing the relationship between the performance of students and their interactions with the website, we can identify how the students with good performance are different from those with bad performance. Our approach can also guide teachers to help the students with bad performance and web developers to refine the design of the website. The proposed approach can provide personalized math question recommendations for students to improve the efficiency of answering math questions and increase the capabilities of students. By showing the possibility that students answer a question correctly, our approach can help teachers adjust the question and increase the confidence of students.

Apr. 2018 - Apr. 2021

Augmented Reality Map Navigation Based on the Actual Street View

Zhejiang University

I developed an augmented reality map navigation application based on the actual street view. Users are allowed to use the camera of a cellphone to capture the street view and the output of route planning will be displayed on it.

Feb. 2017 - Jun. 2017

Particle System for Realistic Rendering

Zhejiang University

I developed a particle system for realistic rendering, which can be used to generate rain, fire, the waterfall, and so on.

Sep. 2016 - Jun. 2017

Visual Analysis of Park Visitor Data

Zhejiang University

I developed a visual analytics system for park managers to explore the spatiotemporal data of park visitors. It can help park managers identify anomalies and take measures to solve the problems identified.

Sep. 2015 - Jan. 2016

Search Engine for the Intramural Forum of Zhejiang University

Zhejiang University

I developed a search engine for the intramural forum of Zhejiang University, which is much powerful than the search engine provided by the forum.

Jul. 2015 - Aug. 2015

Stock Management System

Zhejiang University

I developed a visualization system for stock trading and revenue inspection.

Feb. 2016 - Jul. 2016

Intelligent Food Ordering System

Zhejiang University

I implemented the front-end ordering platform and the back-end order processing module. The system is deployed on a Raspberry Pi.

Feb. 2016 - Jul. 2016

JavaScript Compiler

Zhejiang University

I developed a JavaScript compiler and optimized the algorithms used for the compiler.

Feb. 2016 - Jul. 2016

Online Chat System

Zhejiang University

I developed an online chat system, which supports both the one-one-one chat and the multi-person chat.

Feb. 2016 - Jul. 2016

MiniSQL Database

Zhejiang University

I implemented the data structure of B+ tree and the data storage module of the MiniSQL database.

Sep. 2015 - Jan. 2016

Weather Forecast Android Application

Zhejiang University

I developed an Android application for weather forecast.

Sep. 2015 - Jan. 2016

Escape the Room Game

Zhejiang University

I created the 3D scenario of the Escape the Room game by using OpenGL.

Sep. 2015 - Jan. 2016

Library Management System

Zhejiang University

I developed the online library management system.

Feb. 2015 - Jul. 2015

Drawing Software

Zhejiang University

I developed the drawing software and provides a number of functions for users by using c++.

Sep. 2014 - Jan. 2015

Experience

Teaching Assistant of the Java Course

HKUST

I gave lab courses, solved the problems in teaching and learning, designed the exam paper, and graded the homework, projects and exam papers.

Feb. 2021 -

Teaching Assistant of Python Bridging Course

HKUST

I gave lab courses, solved the problems in teaching and learning, designed the exam paper, and graded the homework, projects and exam papers.

Sep. 2019 - Dec. 2019

Teaching Assistant of Advanced Computer Graphics

HKUST

I gave lab courses, solved the problems in teaching and learning, and graded the homework, projects and exam papers.

Sep. 2018 - Dec. 2018

Teaching Assistant of Data Visualization

HKUST

I gave lab courses, solved the problems in teaching and learning, designed the exam paper, and graded the homework, projects and exam papers.

Feb. 2018 - Jun. 2018

Honors & Awards

National Scholarship	*Zhejiang University*
Excellent Student Awards	*Zhejiang University*
First-class Scholarship for Outstanding Students	*Zhejiang University*
Academic Excellence First Class Scholarship	*Zhejiang University*
First Prize of International Mathematical Modeling Competition	*Zhejiang University*
Second Class Commendation for Military Training	*Zhejiang University*
Third Prize of College Student Physics Innovation Competition in Zhejiang Province	*Zhejiang University*
Third Prize of Micro-Fiction Contest: Write Something about the Winter	*Zhejiang University*

Skills

Programming	C, C++, Java, Javascript, Python, PhP, Android, SQL, HTML, D3.js, Vue.js, BootStrap, Flask, Django
Data Engineering	sklearn, pandas, TensorFlow, Apache, SQL Server, MySQL, MongoDB
Languages	English, Chinese