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Making Effective Queries on Time-Varying Multi-Dimensional Datasets

Many problems are observed in the form of time-varying multi-dimensional datasets. In this lecture, we will discuss how large datasets of this kind are visually explored, with a particular focus on two kinds of dynamic visual querying, namely, query by example and query by sketch. These querying approaches serve as more efficient ways of identifying observable and recurring time variation patterns in long-term datasets. Dynamic visual querying is amplified with an auxiliary mechanism called "fact-guided querying," which is intended to iteratively refine queries and results by specifying a query on the basis of the findings of a previous query. The efficacy of these concepts will be illustrated with actual analysis examples executed in a visual analytics environment called TimeTubeX for blazar observation research.

Issei Fujishiro is currently a professor of information and computer science, Keio University in Yokohama, Japan and holds an adjunct position at the School of Computer Science at Hangzhou Dianzi University in Hangzhou, China. He received his doctor of science degree in information sciences from the University of Tokyo in 1988. His research interests include applied visualization design and lifecycle management. Professor Fujishiro served on the editorial board of Computers and Graphics (Elsevier, 2003–2013) and has been carrying on with the same position at IEEE TVCG (1999–2003, 2018–2022) and the Journal of Visual Informatics (Elsevier, 2016 to present). He co-founded IEEE PacificVis as a program chair in 2008 and took on the position of general chair of PacificVis 2014. He also worked as a SciVis paper co-chair of IEEE VIS 2019/2018 and a workshop chair of PacificVAST 2018 and TopoInVis 2017. At present, he is the president of the Visualization Society of Japan and a member of the Science Council of Japan. He is a fellow of JFES and IPSJ, an honorary member of IIEEJ, a senior member of IEEE and ACM, and a 2021 inductee into the IEEE Visualization Academy.