Visualization for Trust in Machine Learning Revisited: The State of the Field in 2023 — Survey Summary

Table 1: The summary of our survey (as of September 20, 2023). See the updated survey data at `https://trustmlvis.lnu.se`

| # | Technique | A.1.1 Biology | A.1.2 Business | A.1.3 Computer Vision | A.1.4 Computers | A.1.5 Health | A.1.6 Humanities | A.1.7 Nutrition | A.1.8 Simulation | A.1.9 Social / Socioeconomic | A.1.10 Other (Domain) | A.2.1 Binary | A.2.2 Multi-class | A.2.3 Multi-label | A.2.4 Continuous | A.3.1 Other (Target Var) | B.1.1 Convolutional Neural Network (CNN) | B.1.2 Deep Convolutional Network (DCN) | B.1.3 Deep Belief Network (DBN) | B.1.4 Deep Neural Network (DNN) | B.1.5 Deep Q-Network (DQN) | B.1.6 Generative Adversarial Network (GAN) | B.1.7 Long Short-Term Memory (LSTM) | B.1.8 Recurrent Neural Network (RNN) | B.1.9 Variational Auto-Encoder (VAE) | B.1.10 Other (DL Methods) | B.1.11 Linear | B.1.12 Support Vector | B.1.13 Bagging | B.1.14 Boosting | B.1.15 Stacking | B.1.16 Other (Generic ML Methods) | B.2.1 Decision Tree | B.2.2 Regression | B.2.3 Other | B.3.1 Association | B.3.2 Clustering | B.3.3 DR | B.3.4 Classification | B.3.5 Clustering | B.4.1 Control | B.4.2 Dimensionality / Layout | C.1 Preprocessing / Model | C.2 Preprocessing / Output | C.3 Postprocessing / Output | D.1 Model-agnostic / Black Box | D.2 Model-specific / White Box | E.1.1 1D | E.1.2 2D | E.2.1 Connected | E.2.2 Mapped | E.3.1 Aggregated Information | E.3.2 Individual / Instances | E.4.1 Bar Charts | E.4.2 Box Plots | E.4.3 Matrix | E.4.4 Glyphs / Icons / Thumbnails | E.4.5 Graphs / Trees / Approaches | E.4.6 Histograms | E.4.7 Histograms | E.4.8 k-fold Plots | E.4.9 Line Charts | E.4.10 Other (Statistics) | E.4.11 Partial Dependence Plots (PDP) | E.4.12 Pixel-based Approaches | E.4.13 Radial Layouts | E.4.14 Scatterplot Matrices (SPLOMs) | E.4.15 Scatterplots / Projections | E.4.16 Table Based Approaches | E.4.17 Tables / Lists | E.4.18 Treemaps | E.4.19 Other (Visual) | E.5.1 Select | E.5.2 Explore / Browse | E.5.3 Recalligner | E.5.4 Encode | E.5.5 Filter / Query | E.5.6 Annotate / Elaborate | E.5.7 Derive / Record | E.5.8 Guide / Suggest | E.5.9 Verbalize | E.6.1 Color | E.6.2 Opacity | E.6.3 Position / Orientation | E.6.4 Shape | E.6.5 Size | E.6.6 Texture | F.1.1 Standard | F.1.2 Other Technique | F.2.1 Before / During Development | F.2.2 After Development | F.3 Not Evaluated | G.1 Source Reliability | G.1.1 Uncertainty Representation Process | G.2.1 Uncertainty Awareness | G.2.2 Equality / Data Bias | G.2.3 Comparison (of Stakeholders) | G.2.4 Guidance / Recommendations | G.2.5 Conflict Detection | G.2.6 Trade-off | G.3.1 Understanding / Explanation | G.3.2 Debugging / Diagnosis | G.3.3 Refinement / Scoring | G.3.4 Comparison | G.3.5 Interactivity | G.4.1 Fairness | G.4.2 Expertise | G.4.3 In Situ Comparison | G.4.4 Workflows | G.4.5 Visual Analytics | G.4.6 Model Dial | G.4.6 Model Ventures | G.5.1 Agreement of Colleagues | G.5.2 Visualization Evaluation | G.5.3 Value | G.5.4 Bias | H1 Beginners | H2 Practitioners / Domain Experts | H3 Developers | H4 Researchers |
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Table 2: The summary of our survey (continued).

| # | Technique | A1.1 Biology | A1.2 Business | A1.3 Computer Vision | A1.4 Computers | A1.5 Health | A1.6 Humanities | A1.7 Nature | A1.8 Simulation | A1.9 Sports / Sportscommar | A1.10 Other (Domain) | A2.1 Video | A2.2 Image | A2.3 Multi-Label | A2.4 Continuous | A3.1 Other (Target Var.) | B1.1.1 Convolutional Neural Network (CNN) | B1.1.2 Generative Adversarial Network (GAN) | B1.1.3 Graph Neural Network (GNN) | B1.1.4 Deep Neural Network (DNN) | B1.1.5 Deep Q-Network (DQN) | B1.1.6 Generative Adversarial Network (GAN) | B1.1.7 Long Short-Term Memory (LSTM) | B1.1.8 Recurrent Neural Network (RNN) | B1.1.9 Variational Auto-Encoder (VAE) | B1.1.10 Other (DL Models) | B1.2.1 Linear | B1.2.2 Logistic Regression | B1.2.3 Bagging | B1.2.3 Boosting | B1.2.3 Stacking | B1.2.4 Other (Generic ML Models) | B1.2.5 Decision Tree | B1.2.6 Regression | B1.2.8 Other | B2.2.1 Association | B2.2.2 Clustering | B2.2.3 Other | B2.2.4 Dimensionality Reduction | B2.2.5 Other (Feature Extraction | B2.4.1 Other (Clustering | B2.4.2 Control | B3.1 Interpretability / Hyper | C2 Reprocessing / Model | C3 Post-processing / Output | D1 Model-agnostic / Black Box | D2 Model-specific / White Box | E1.1 2D | E1.2 3D | E2.1 Computed | E2.2 Mapped | E2.3 Aggregated Information | E3.1 Interactive-based / Interactive | E3.2 Interactive-based / Static-Visual | E4.1 Matrix | E4.2 Box Plots | E4.3 Matrix | E4.4 Glyphs / Icons / Thumbnails | E4.5 Graph-based Approaches | E4.6 Pixel-based Approaches | E4.7 Histogram | E4.8 Scatter Plots | E4.9 Line Charts | E4.10 Node-link Diagrams | E4.11 Other (Chart / Plots (PCP)) | E4.12 Pixel-based Approaches | E4.13 Radial Layouts | E4.14 Scatterplot Matrices (SPLOMs) | E4.15 Scatterplots / Projections | E4.16 Stacked Graphs | E4.17 Tables / Lists | E4.18 Treemaps | E4.19 Other (Visual.) | E5.1 Select | E5.2 Navigate / Browse | E5.3 Reconfigure | E5.4 Encode | E5.5 Filter / Query | E5.6 Annotate / Elaborate | E5.7 Other | E6.1 Color | E6.2 Opacity | E6.3 Size / Orientation | E6.4 Shape | E6.5 Size | E6.6 Texture | F1.1 Standard | F1.2 Other | F2.1 Iterative / Data Development | F2.2 After Development | F3 Set Evaluated | G1.1 Source Reliability | G1.2 Uncertainty | G1.3 Transparent Calculation | G1.4 Transparent Calculation Process | G1.5 Model Information | G1.6 Model Performance | G2.1 Understanding / Explanation | G2.2 Debugging / Diagnosis | G2.3 Refinement / Steering | G2.4 Comparison | G2.5 Model Improvability | G3.1 Fairness | G3.2 In-Situ Comparison | G4.1 Experience | G4.2 Performance | G4.3 Adoption / Process | G4.4 Model Bias | G4.5 Model Variance | G5.1 Agreement of Colleagues | G5.2 Visualization Evaluation | G5.3 Quantitative Evaluation / Results | G5.4 User Bias | H1 Beginners | H2 Practitioners / Domain Experts | H3 Developers | H4 ML Experts |
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Table 3: The summary of our survey (continued).

| # | Technique | A1.1 Bridge | A1.2 Business | A1.3 Computer Vision | A1.4 Computers | A1.5 Health | A1.6 Humanities | A1.7 Science | A1.8 Simulation | A1.9 Sociotechnic | A1.10 Other (Domain) | A2.1 Tabular | A2.2 Time series | A2.3 Multivariate | A2.4 Other (Data Via) | B1.1 Convolutional Neural Network (CNN) | B1.2 Recurrent Neural Network (RNN) | B1.3 Graph Convolutional Network (GCN) | B1.4 Deep Neural Network (DNN) | B1.5 Deep Q-Network (DQN) | B1.6 Generative Adversarial Network (GAN) | B1.7 Long Short-Term Memory (LSTM) | B1.8 Recurrent Neural Network (RNN) | B1.9 Variational Autoencoder (VAE) | B1.10 Other (DL Methods) | B2.1 Linear | B2.2 Decision Tree | B2.3 Bagging | B2.4 Boosting | B2.5 Stacking | B2.6 Other (Generic ML Methods) | B3.1 Kernel Density Estimation | B3.2 Regression | B3.3 Other | B3.4 Association | B3.5 Clustering | B3.6 Dimensionality Reduction | B3.7 Other | B3.8 Classification | B3.9 Clustering | B3.10 Other | B4.1 Control | B4.2 Reinforcement / Imitation | C2 Pre-processing / Model | C3 Post-processing / Output | D1 Model-agnostic / Black Box | D2 Model-specific / White Box | E1.1 2D | E1.2 3D | E2.1 Computed | E2.2 Mapped | E2.3 Aggregated Information | E3.1 Interactive Selection | E3.2 Interactive Navigation | E3.3 Interactive Filter / Interrelate | E4.1 Box Plots | E4.2 Matrix | E4.3 Glyphs / Icons / Thumbnails | E4.4 Graph-based Approaches | E4.5 Pixel-based Approaches | E4.6 Tree | E4.7 Histogram | E4.8 Area Plots | E4.9 Line Charts | E4.10 Node-Link Diagrams | E4.11 Other Chart Types Plots (PCP) | E4.12 Pixel-based Approaches | E4.13 Radial Layouts | E4.14 Scatterplot Matrices (SPLOMs) | E4.15 Scatterplots / Projections | E4.16 Other Charts | E4.17 Tables / Lists | E4.18 Treemaps | E4.19 Other (Visual.) | E5.1 Select | E5.2 Explore / Browse | E5.3 Recordings | E5.4 Records | E5.5 Filter / Query | E5.6 Annotate / Elaborate | E5.7 Share | E5.8 Guidance / Shared | E5.9 Verbalize | E6.1 Color | E6.2 Opacity | E6.3 Emphasis / Attention | E6.4 Shape | E6.5 Size | E6.6 Texture | F1.1 Standard | F1.2 Other | F2.1 Before / During Development | F2.2 After Development | G1.1 Sec Evaluated | G1.2 Score Reliability | G1.3 Usability / Interaction Process | G1.4 Human Cognition / Collaboration | G2.1 Equality / Data Bias | G2.2 Comparison (of Structure) | G2.3 Guidance / Recommendation | G2.4 Guidance / Recommendation | G2.5 Outlier Detection | G3.1 Explain | G3.2 Understanding / Explanation | G3.3 Debugging / Diagnosis | G3.4 Refinement / Steering | G3.5 Monitoring / Maintainability | G3.6 Accessibility | G4.1 Experience | G4.2 In Situ Comparison | G4.3 Performance | G4.4 Visual Perceptions | G4.5 Bias | G4.6 Model Variance | G5.1 Alignment of Colleagues | G5.2 Visualization Evaluation | G5.3 Model Quality / Results | G5.4 User Bias | H1 Beginners | H2 Practitioners / Domain Experts | H3 Developers |
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Table 4: The summary of our survey (concluded).

| # | Technique | A.1.1 Biology | A.1.2 Business | A.1.3 Computer Vision | A.1.4 Computers | A.1.5 Health | A.1.6 Humanities | A.1.7 Nutrition | A.1.8 Simulation | A.1.9 Social Networks | A.1.10 Other (Domain) | A.2.1 Binary | A.2.2 Multi-class | A.2.3 Multi-label | A.2.4 Other (Target Var.) | B.1.1.1 Convolutional Neural Network (CNN) | B.1.1.2 Deep Convolutional Network (DCN) | B.1.1.3 Deep Feed Forward (DFF) | B.1.1.4 Deep Neural Network (DNN) | B.1.1.5 Graph (GNN) | B.1.1.6 Generative Adversarial Network (GAN) | B.1.1.7 Long Short-Term Memory (LSTM) | B.1.1.8 Recurrent Neural Network (RNN) | B.1.1.9 Variational Auto-Encoder (VAE) | B.1.2.1 Linear (DL Methods) | B.1.2.2 Logistic (DL Methods) | B.1.3.1 Decision Tree | B.1.3.2 Bagging | B.1.3.3 Boosting | B.1.3.4 Random Forest | B.2.1.1 Classification | B.2.1.2 Regression | B.2.1.3 Other | B.2.2.1 Association | B.2.2.2 Clustering | B.2.2.3 DR | B.2.3.1 Classification | B.2.3.2 Clustering | B.2.4.1 Classification | B.2.4.2 Control | C.1 Pre-processing / Input | C.2 Pre-processing / Model | C.3 Post-processing / Output | D.1 Model-agnostic / Black Box | D.2 Model-specific / White Box | E.1.1 2D | E.1.2 3D | E.2.1 Computed | E.2.2 Mapped | E.3.1 Aggregated Information | E.3.2 Instance-based / Individual | E.4.1 Bar Plots | E.4.2 Box Plots | E.4.3 Matrix | E.4.4 Glyphs / Icons / Thumbnails | E.5.1 Grid-based Approaches | E.5.2 Force Based | E.6.1 Heatmap | E.6.2 Hierarchy | E.6.3 Pixel Plots | E.6.4 Line Charts | E.6.5 Node-link Diagrams | E.6.6 Parallel Coordinates Plots (PCP) | E.6.7 Dimensionality Reduction | E.6.8 Treemap | E.6.9 Sankey | E.6.10 Radial Layouts | E.6.11 Sunburst | E.6.12 Scatterplots Matrices (SPLOMs) | E.6.13 Scatterplots / Projections | E.6.14 Similarity Layouts | E.6.15 Other | E.7.1 Tables | E.7.2 Other (Text) | E.7.3 Other (Visual) | E.8.1 Select | E.8.2 Explore / Browse | E.8.3 Reconfigure | E.8.4 Filter | E.8.5 Filter / Query | E.8.6 Abstract / Elaborate | E.8.7 Connect | E.8.8 Guide / Shepard | E.8.9 Other | E.9.1 Volume | E.9.2 Volume | E.9.3 Opacity | E.9.4 Opacity | E.9.5 Position / Orientation | E.9.6 Shape | E.9.7 Size | E.9.8 Texture | F.1.1 Standard | F.1.2 Comparative | F.2.1 Before / During Development | F.2.2 After Development | F.3 Not Evaluated | G.1.1 Usability | G.1.2 Transparent Collection Process | G.2.1 Uncertainty Awareness | G.2.2 Equality / Data Bias | G.2.3 Comparison (of Structures) | G.2.4 Comparison (of Algorithms) | G.2.5 Outlier Detection | G.3.1 Familiarity | G.3.2.1 Understanding / Explanation | G.3.2.2 Debugging / Diagnosis | G.3.2.3 Improvement / Steering | G.3.3 Knowledgeability | G.3.4 Fairness | G.4.1 Experience | G.4.2 In Situ Comparison | G.4.3 Trust / Reliance | G.4.4 Wizard Hypothesis | G.4.5 Model Bias | G.4.6 Model Variance | G.5.1 Argument of Colleagues | G.5.2 Verification/Evaluation | G.5.3 Verify Model / Results | G.5.4 User Bias | H.1 Beginners | H.2 Practitioners / Domain Experts | H.3 Developers | H.4.1 Laypeople |
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