Interaction Concepts for Collaborative Visual Analysis of Scatterplots on Large Vertically-Mounted High-Resolution Multi-Touch Displays

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Introduction and Concepts

Related Work

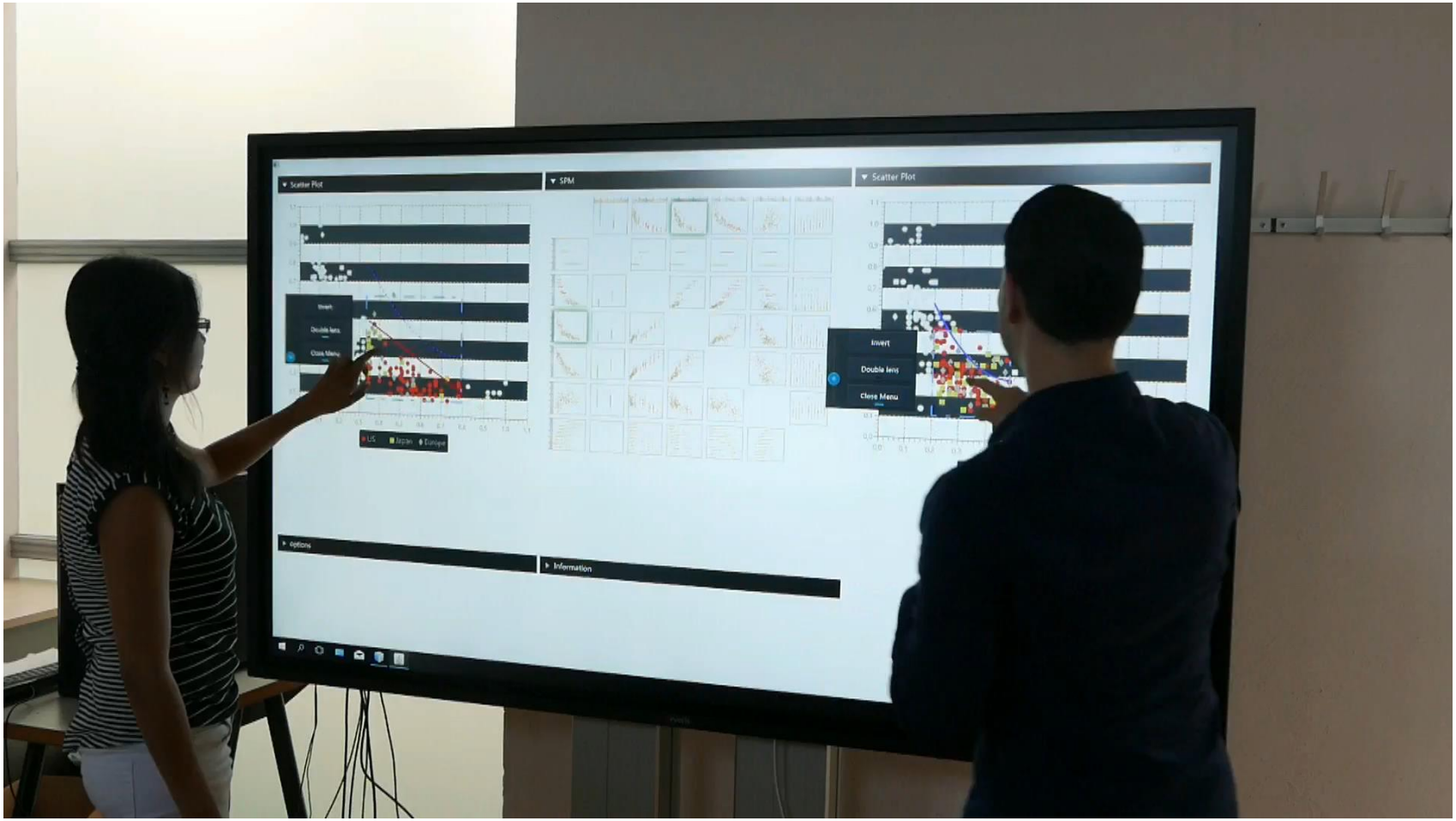
Proposed Interaction Techniques

Use Case

Discussion

1 Introduction and Concepts

Preview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Vertically-Mounted Multi-Touch Displays

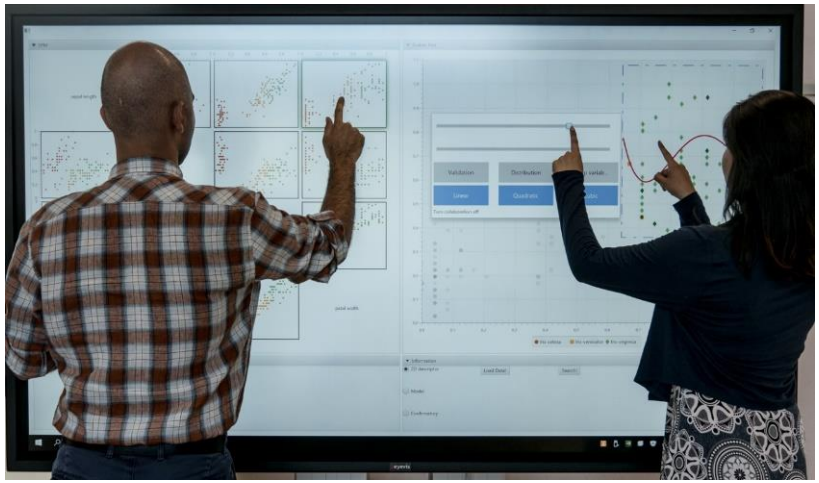
- Large!
- Vertically-Mounted
- High-Resolution
- Multi-Touch
- Example: EYE-LCD-8400-QHD-V2

Large Multi-Touch Screens and Visual Analytics

- Fluid and intuitive interface for up-close interaction.
- Collaboration for small groups.
- Better visualization (more space for multivariate datasets).
- Novel Interaction Techniques.

Question: Large Displays and Scatterplots Analysis?

- SPM visualisation?
- Collaboration on the SPM?
- Scatterplot and the SPM interaction?

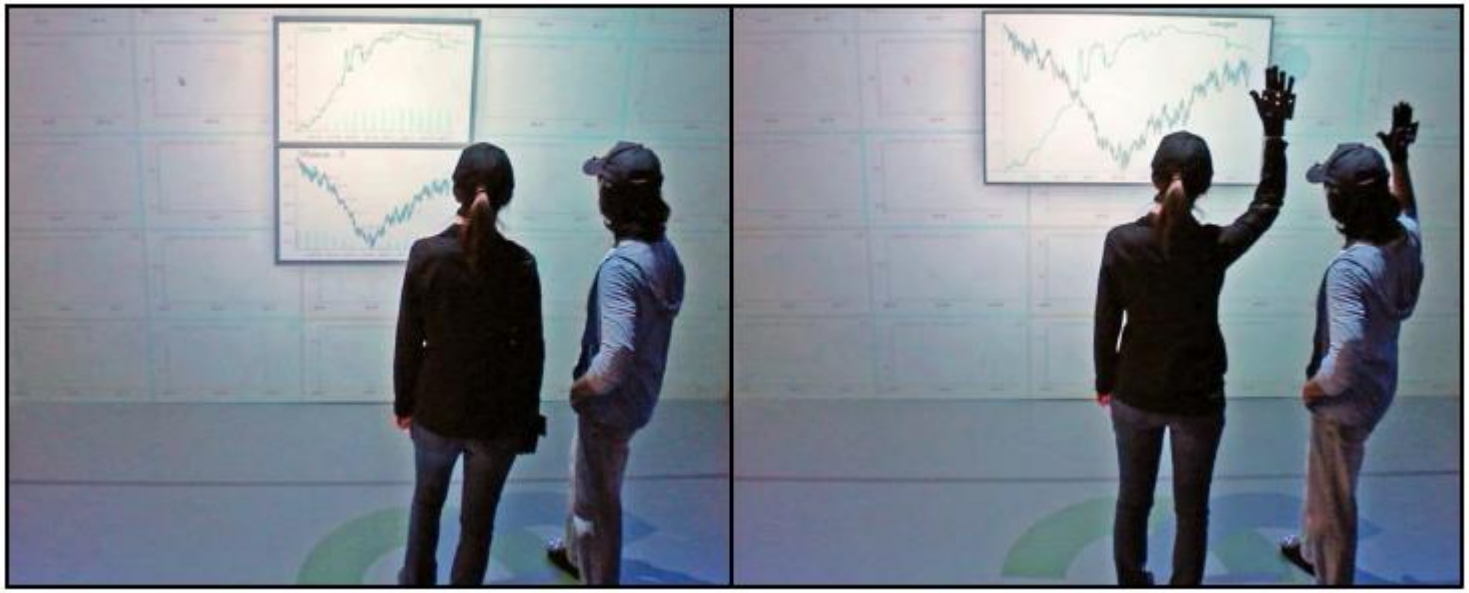


2 Related Work

Visualisation and Interaction on Large Multi-Touch Display

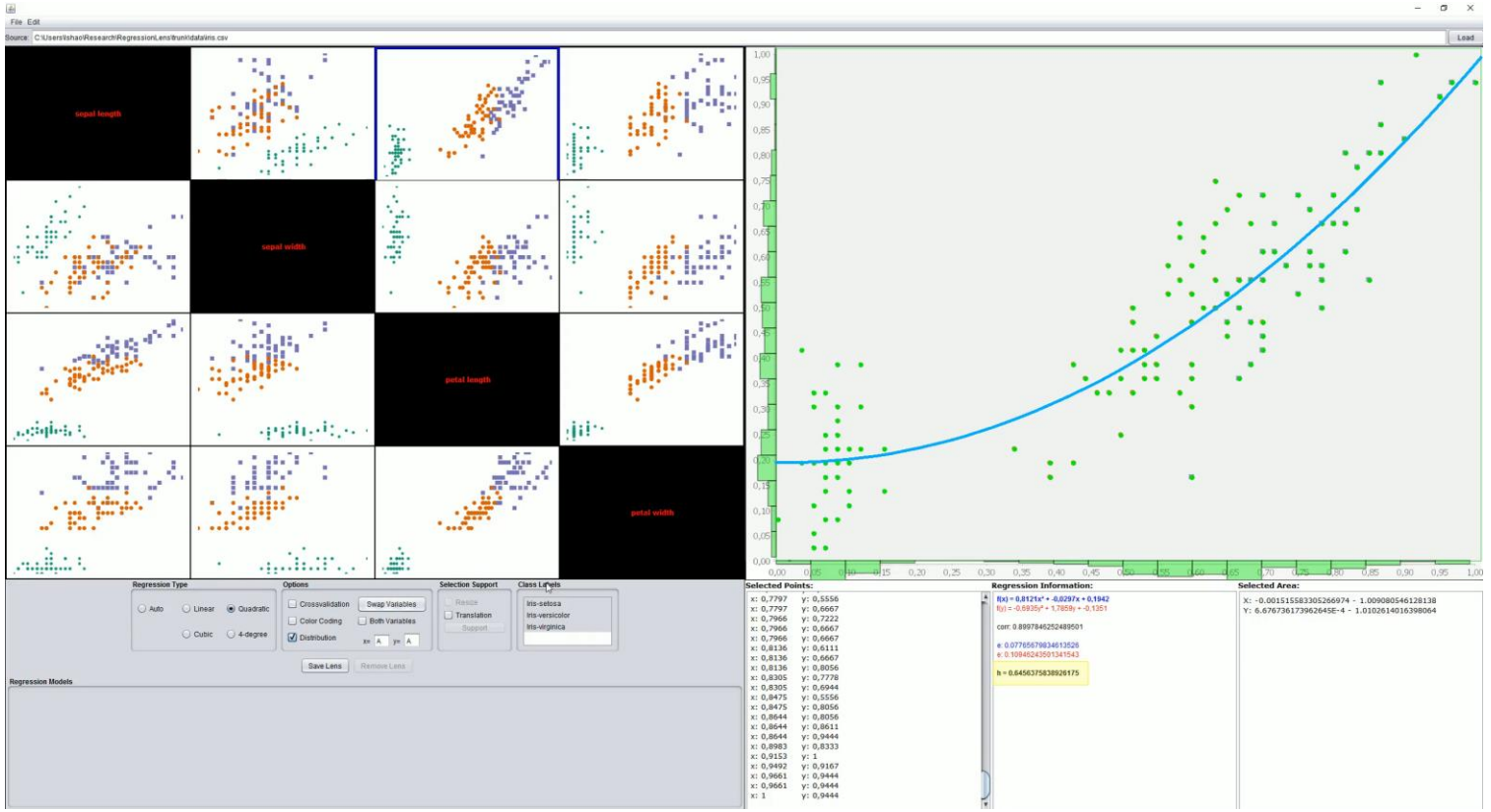
[1] Heilig, Mathias, et al. "Scattertouch: a Multi Touch Rubber Sheet Scatter Plot Visualization for Co-Located Data Exploration." *ACM International Conference on Interactive Tabletops and Surfaces*. ACM, 2010.

Collaboration on Large Display



[2] Badam, Sriram Karthik, et al. "Supporting Visual Exploration for Multiple Ssers in Large Display Environments." *Visual Analytics Science and Technology (VAST), 2016 IEEE Conference on*. IEEE, 2016.

Regression Lens

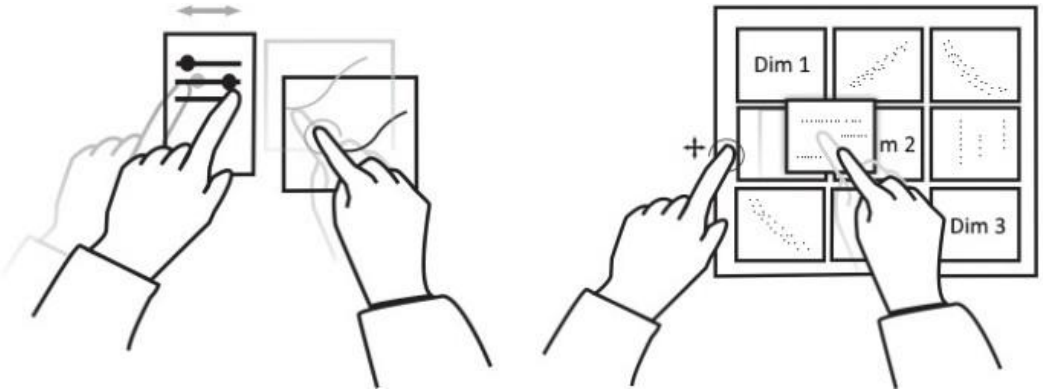


[3] Shao, Lin, et al. "Interactive Regression Lens for Exploring Scatter Plots." *Computer Graphics Forum*. Vol. 36. No. 3. 2017.

3 Proposed Interaction Techniques

Single-User Tasks

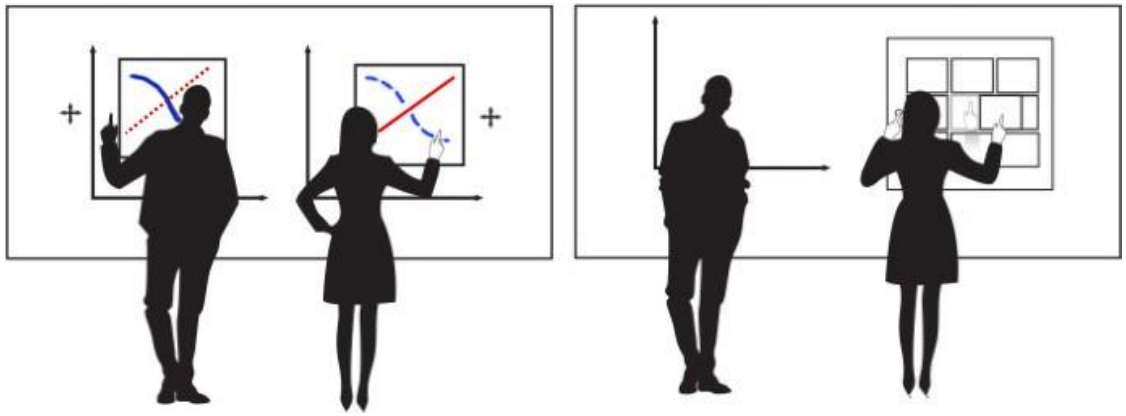
- One person analysing scatterplots.
- Since the screen is large, physical navigation (e.g., walking) is needed.
- The user can use both hands.

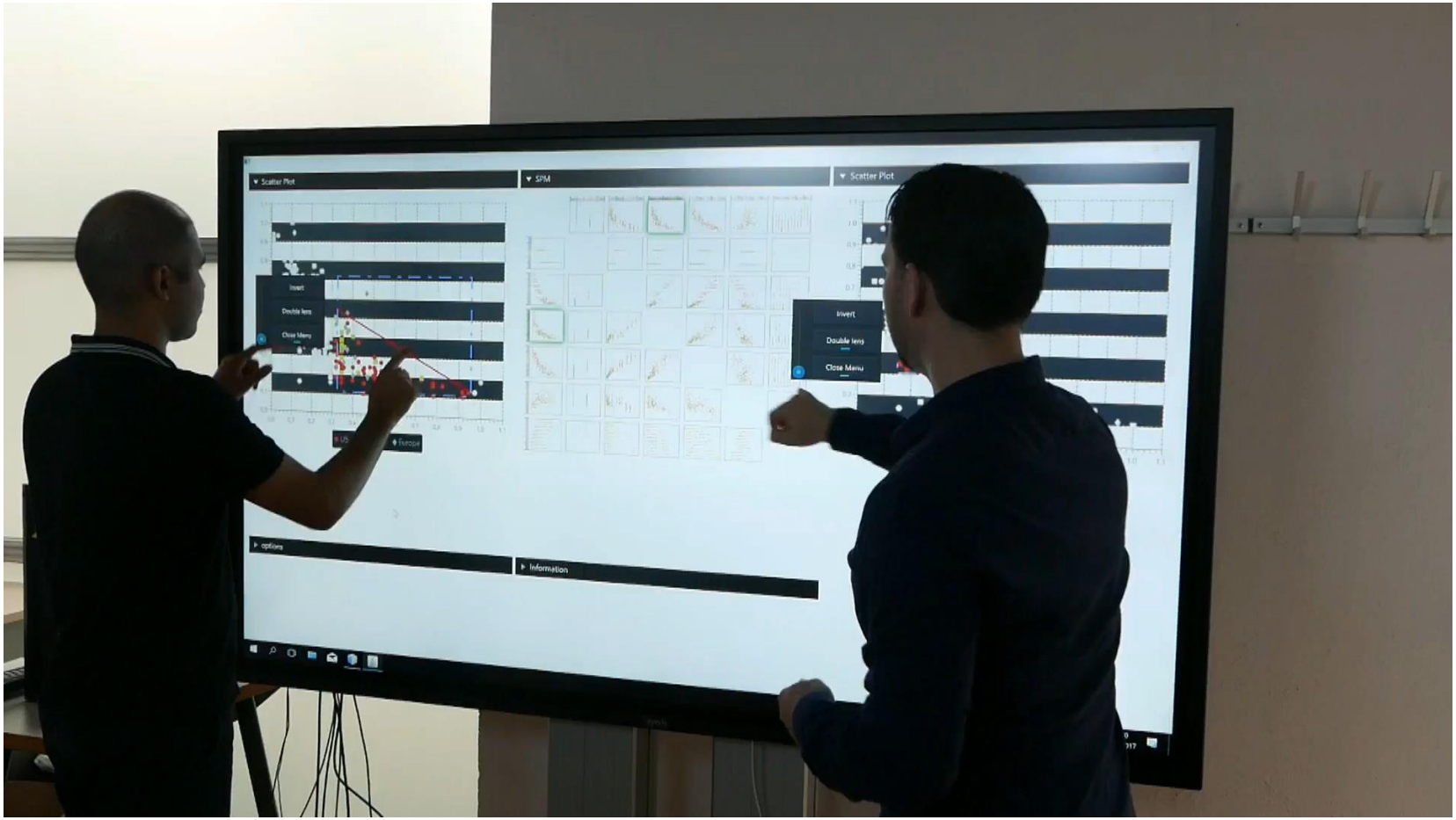


Creating a Regression Lens

Collaborative Tasks

- More than one user.
- Knowing what the other analyst is working on.
- Sharing the information.

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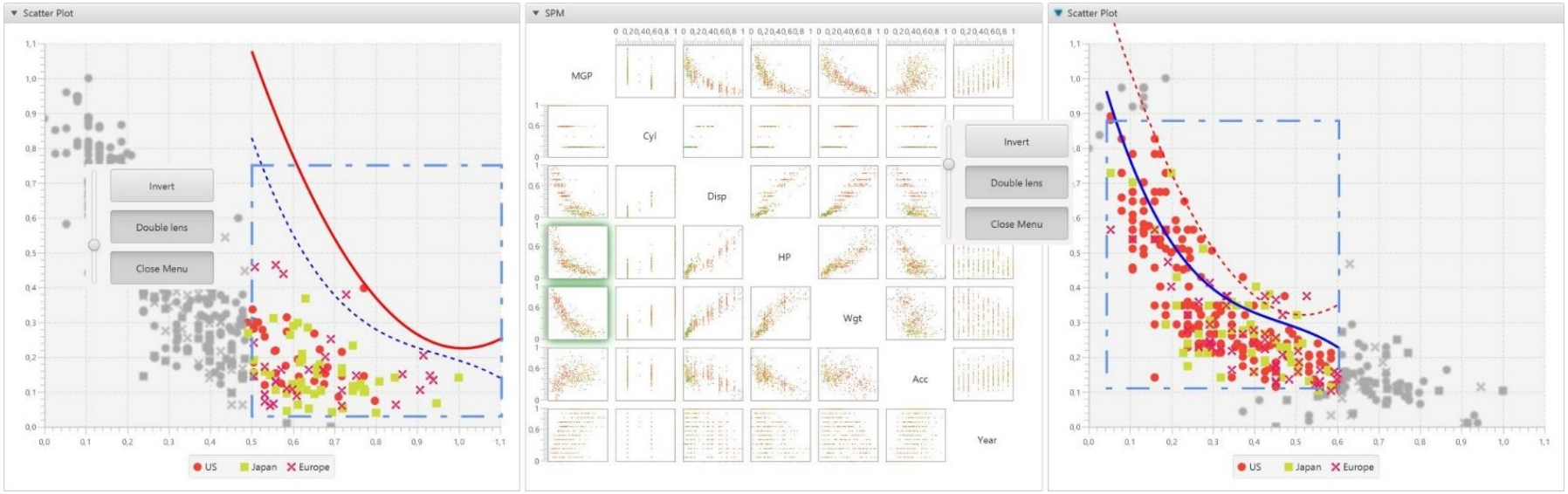
4 Use Case

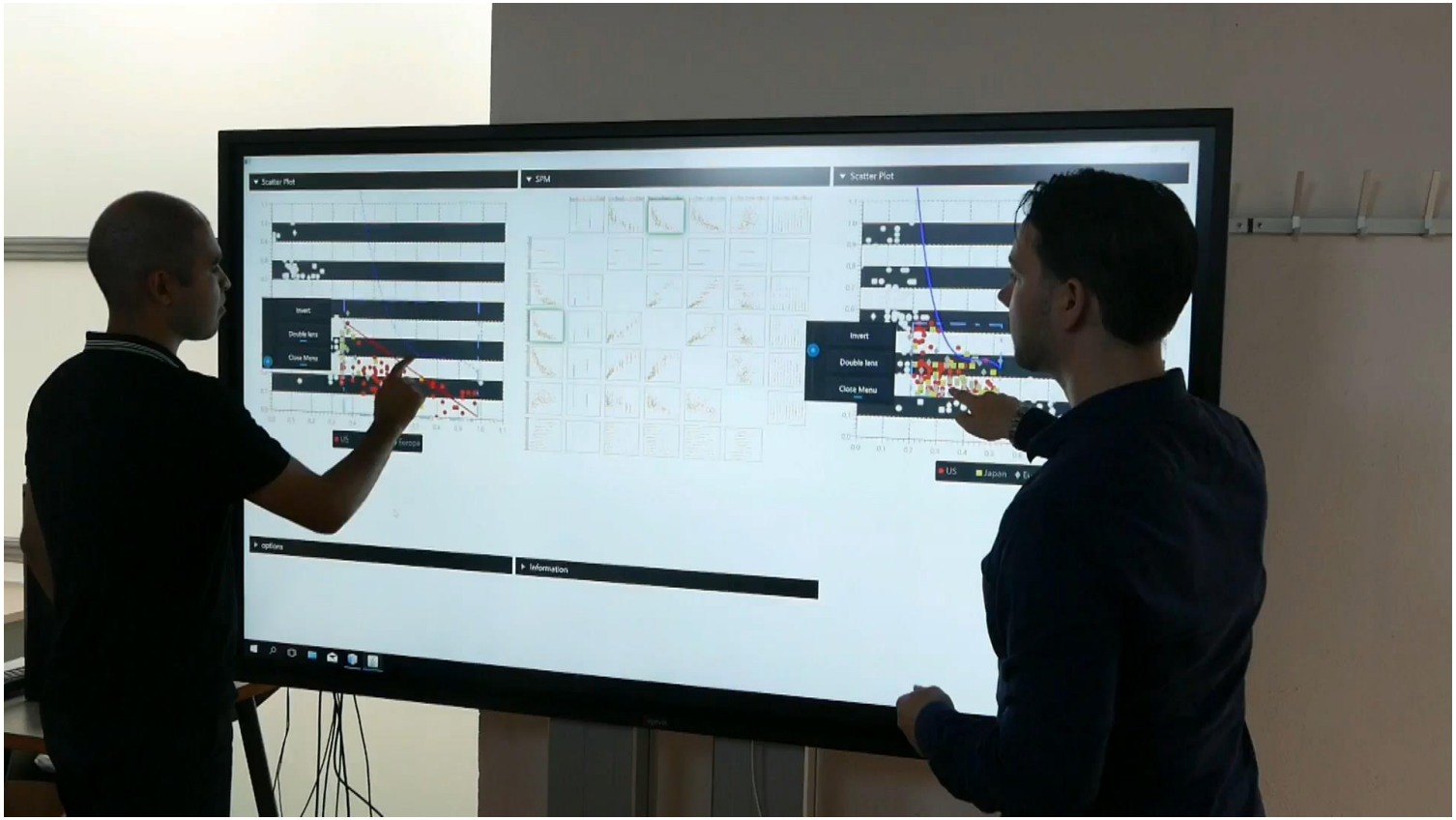
Collaborative Regression Lens

- Two user work on different scatterplots.
- A shared SPM for both.
- Creating a regression model on each plot.

Collaborative Regression Lens (Figure)

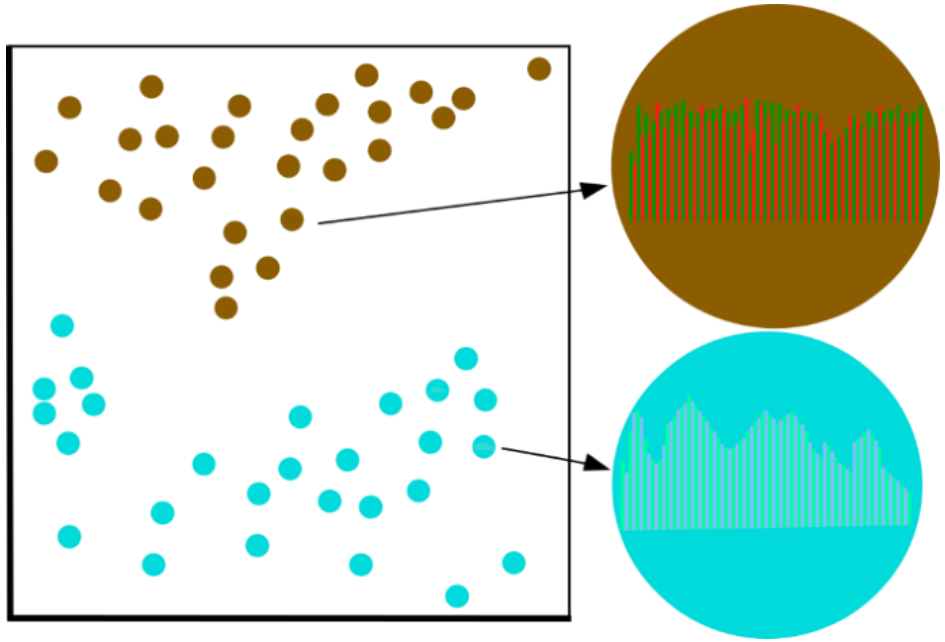


Implementation on eyevis



5 Discussion

Perception-Based Level of Visual Detail



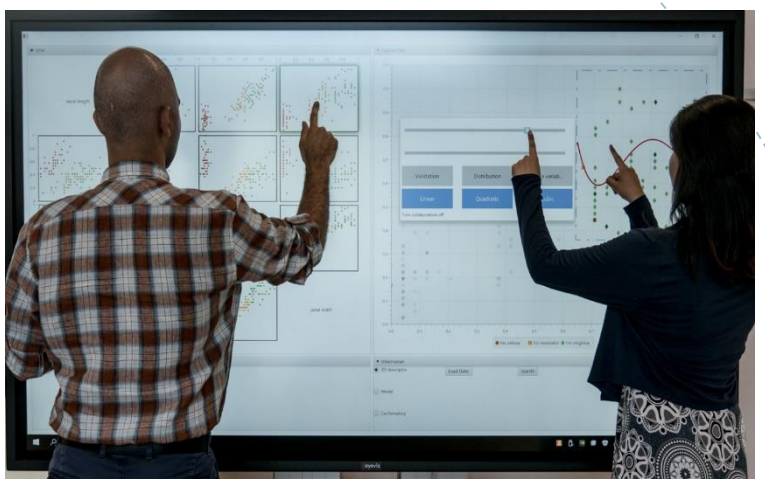
Future Work

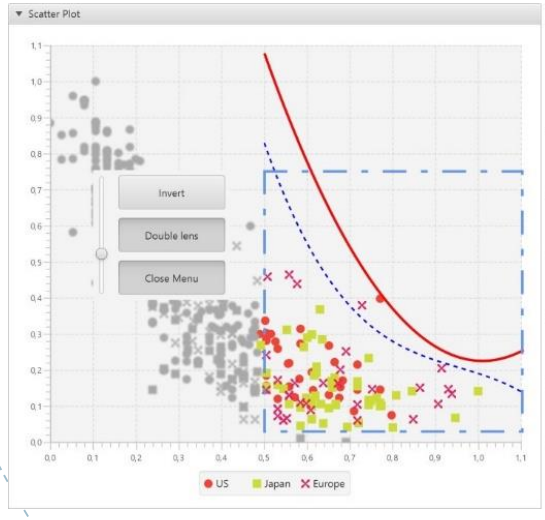
- Other types of multivariate dataset visualisation (e.g., parallel coordinates).
- Use of other interaction modalities combined with multi-touch (e.g., eye-tracking and Kinect).
- Further implementation and evaluation of the current system.

Conclusion

- Large multi-touch screens are new medium for Visual Analytics (both for interaction and visualisation).

- Novel interaction techniques are needed.

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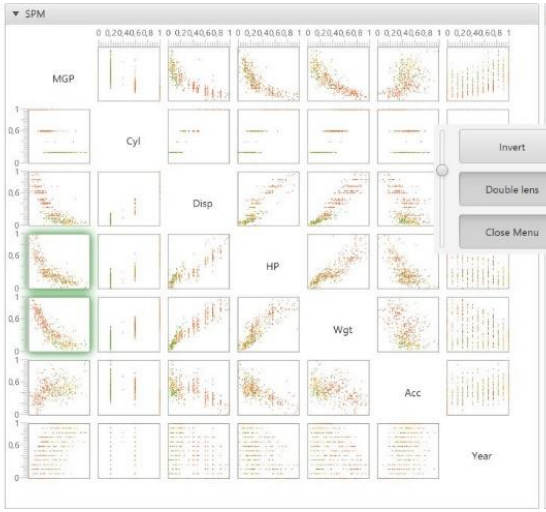
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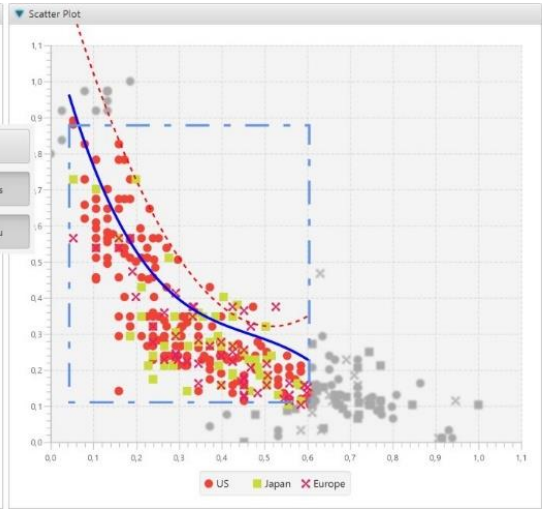
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