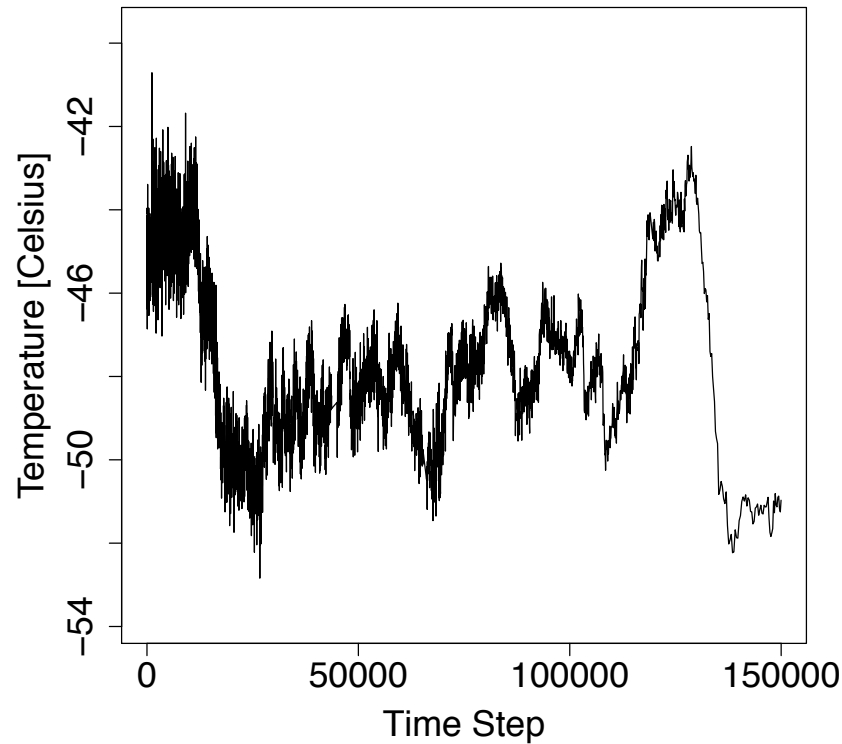


# A Visual Analytics Approach to Multiscale Exploration of Environmental Time Series

Mike Sips, Patrick Koethur, Andrea Unger, Hans-  
Christian Hege, Doris Dransch

# Why Visual Analytics?

- Detect robust indicators for regime changes in temperature



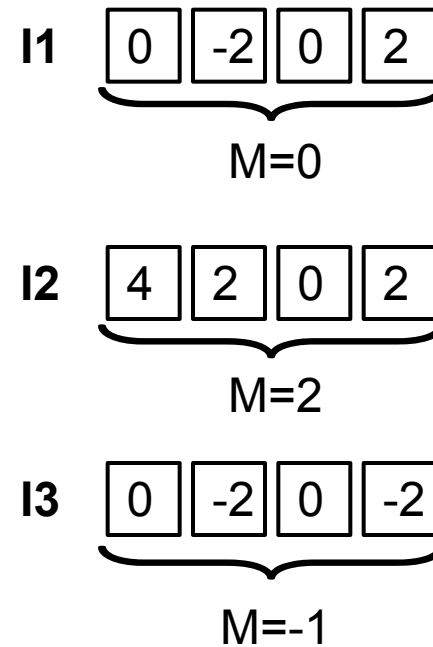
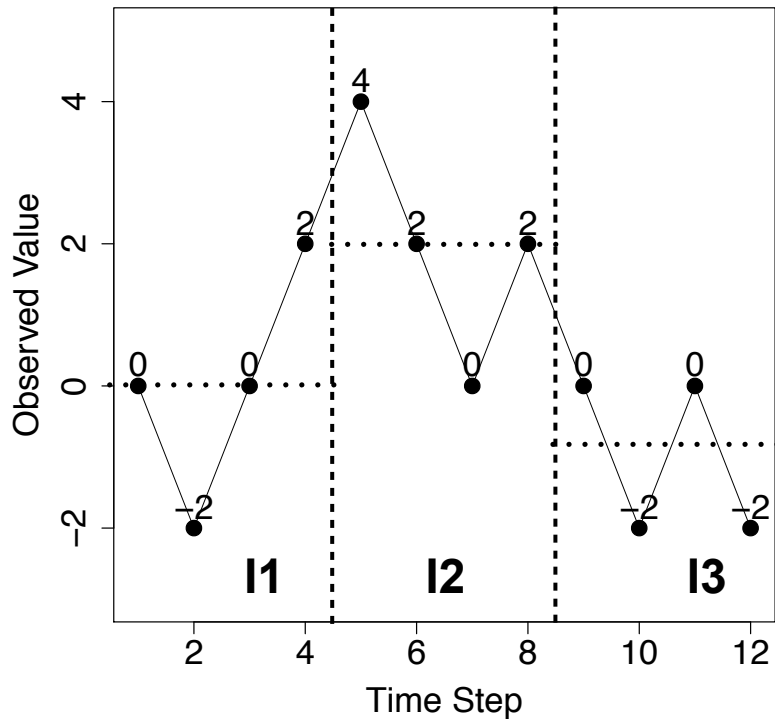
Antarctica - Temperature of the Past

- **What is Visual Analytics?**

Combination of interval-based analysis and multiscale visualization

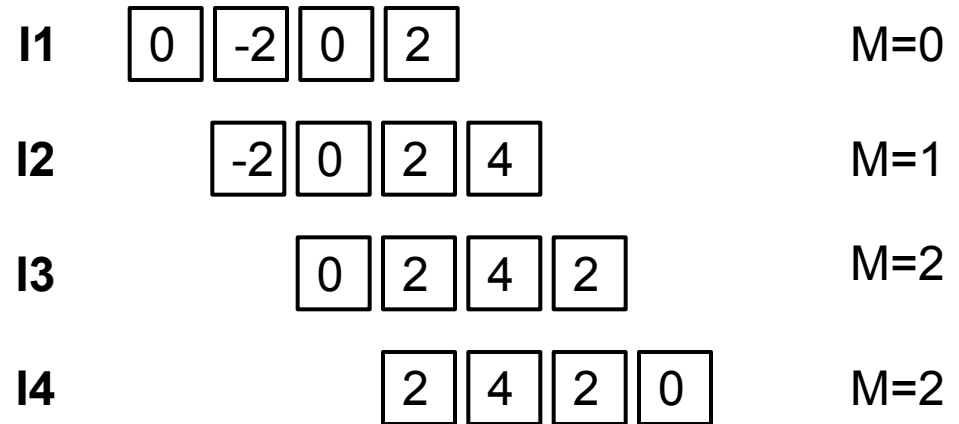
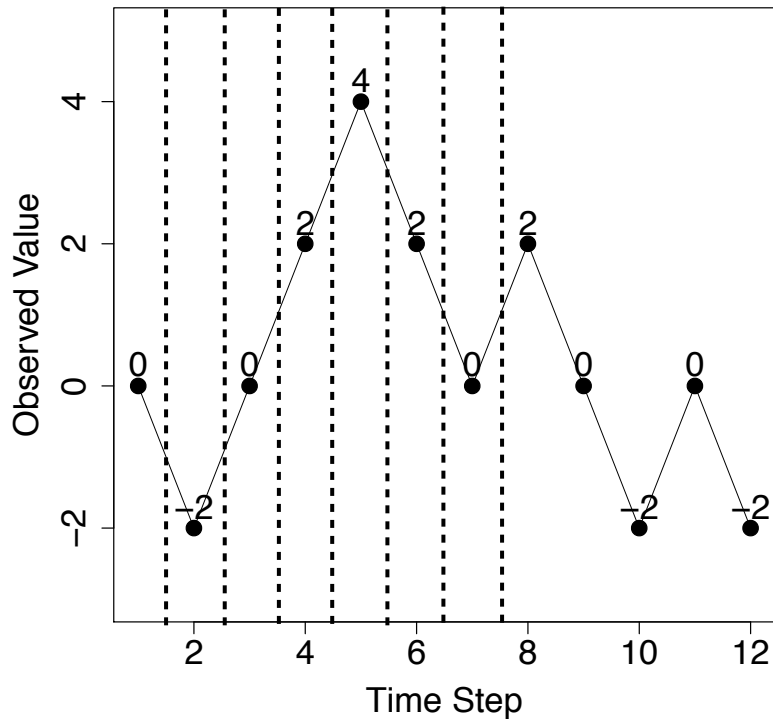
# Interval-based Analysis

- Compute statistical moments for subintervals at particular scale
  - Fixed Scale: 4



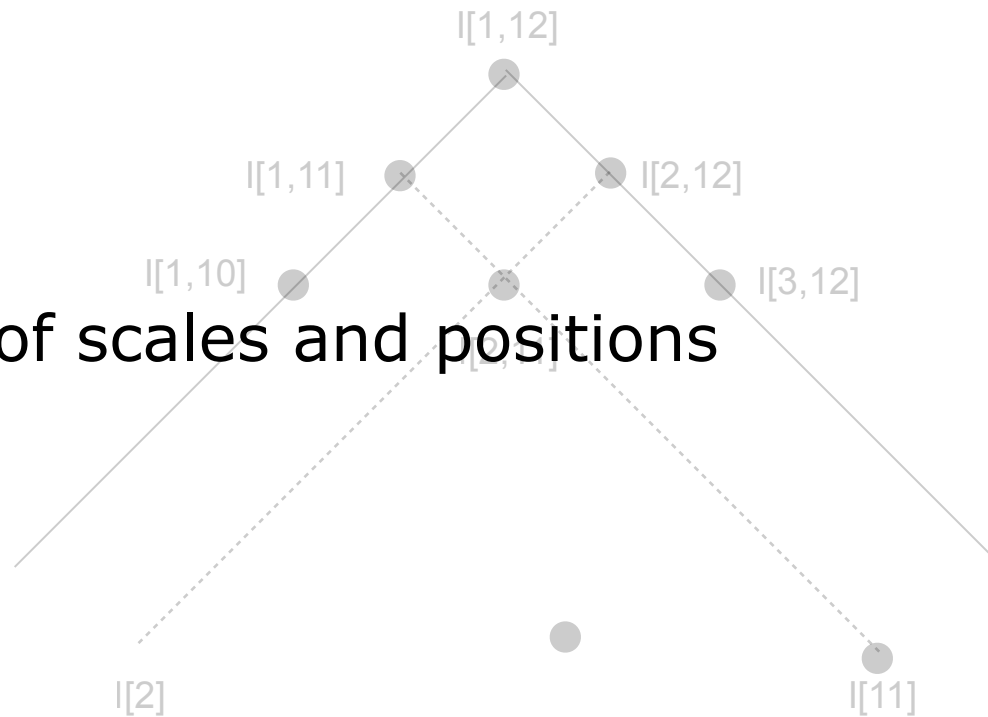
# Starting Position is Crucial

- Chosen fixed scale 4



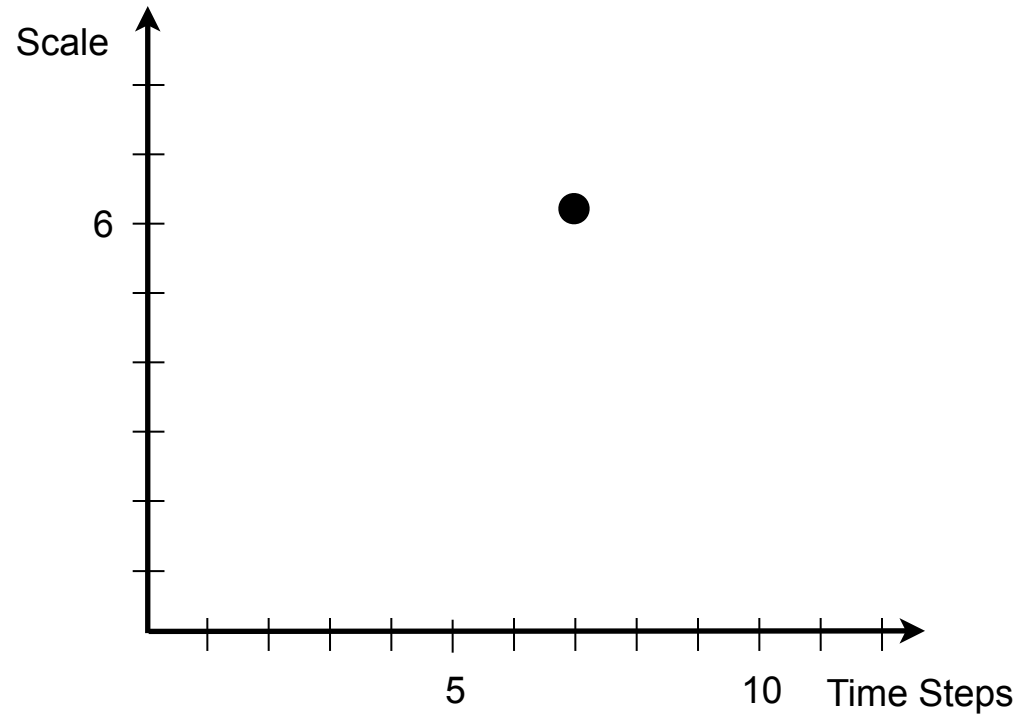
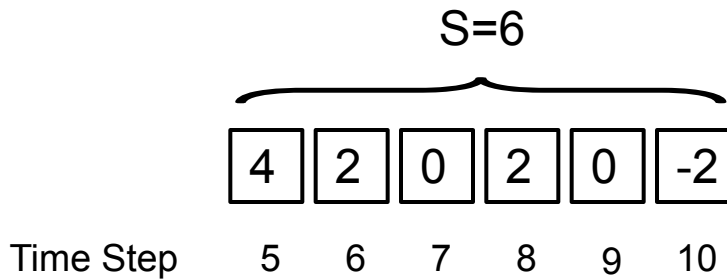
- Pinus

## Hierarchy of scales and positions

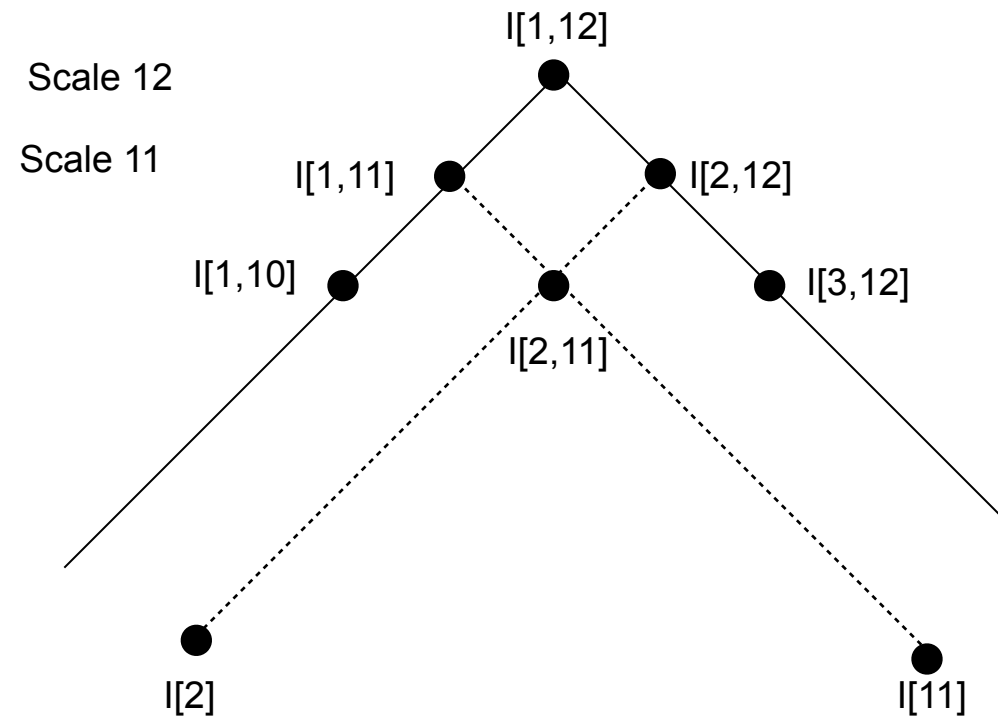
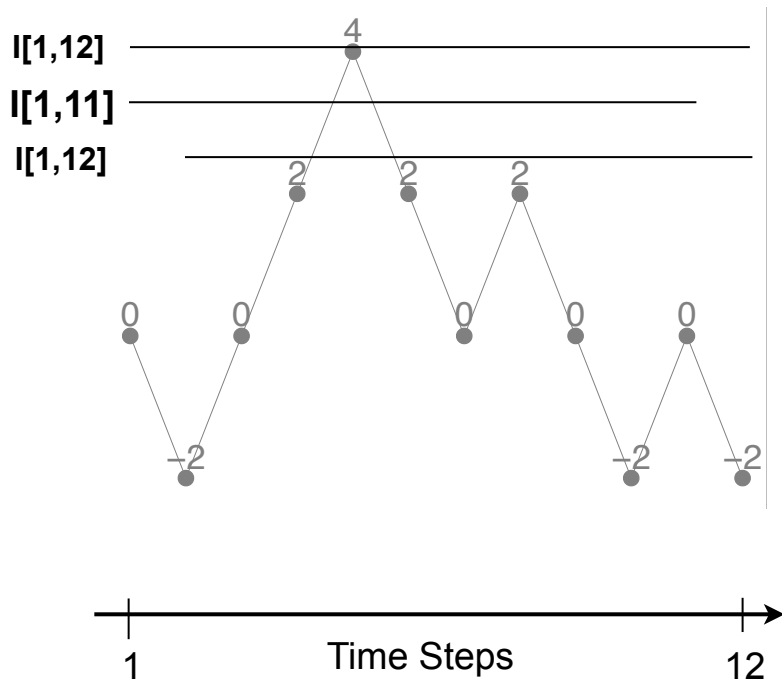


# Interval $\longleftrightarrow$ 2-D Point

- Relationship interval and 2-D point



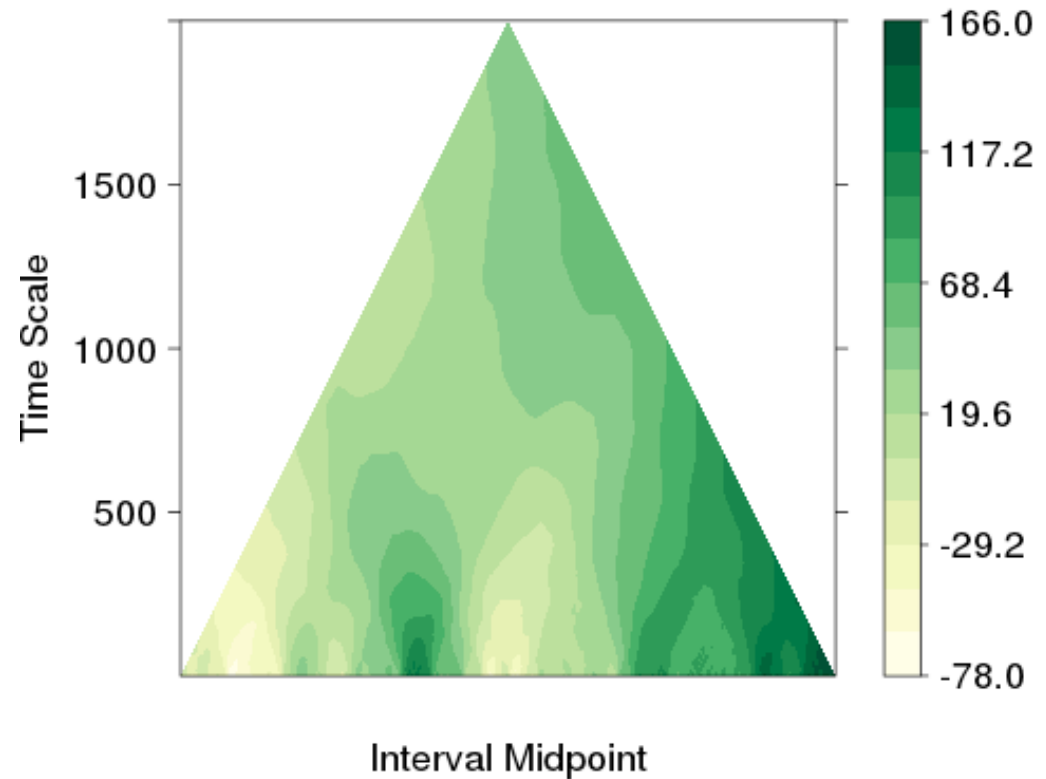
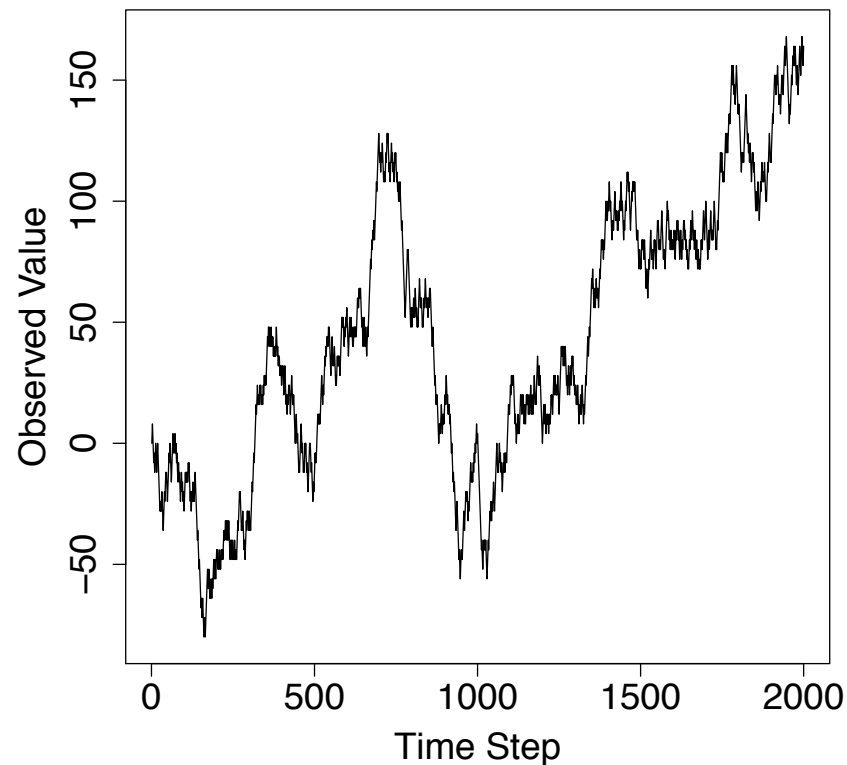
# Hierarchy of Scales and Positions



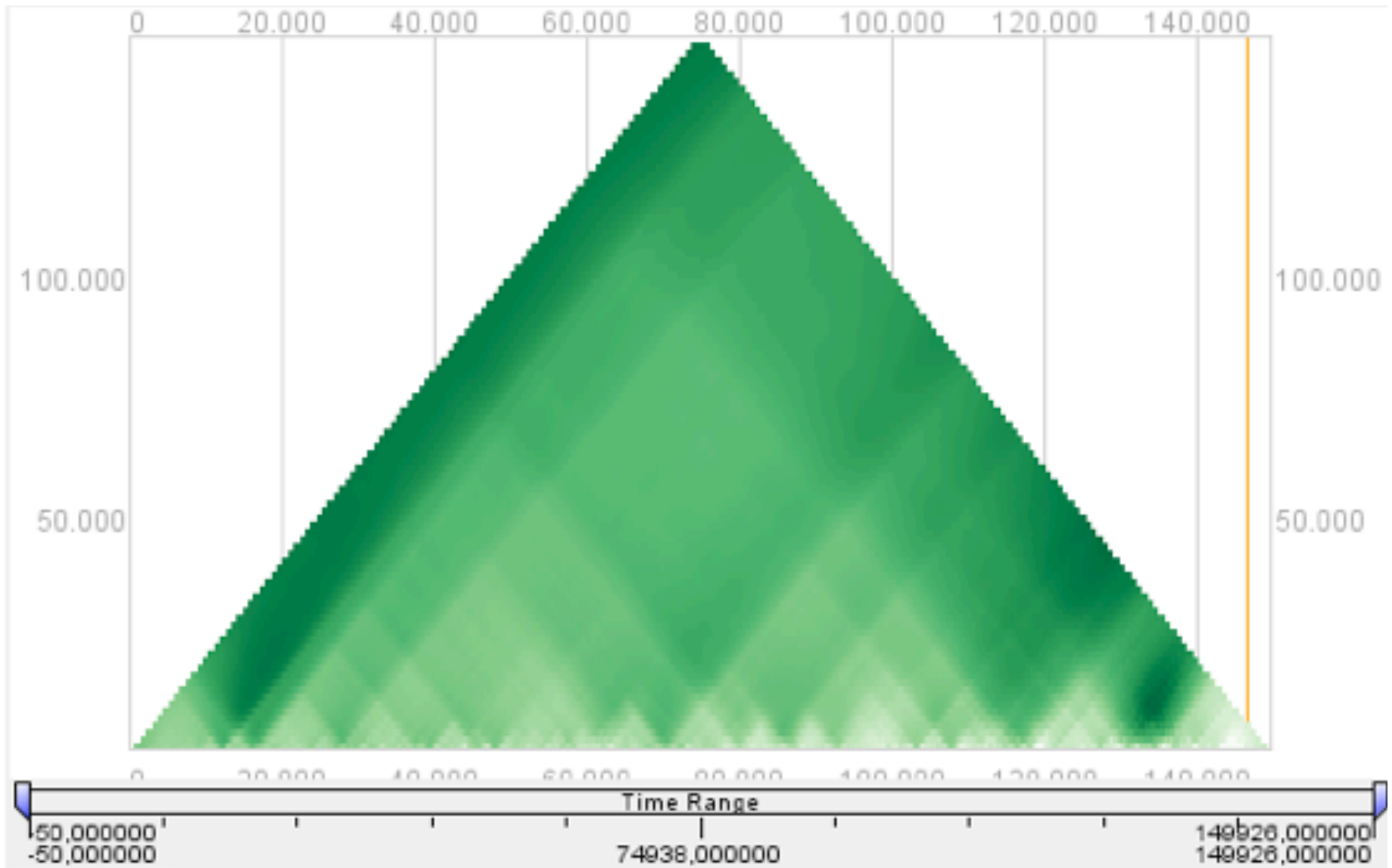


# How to read?

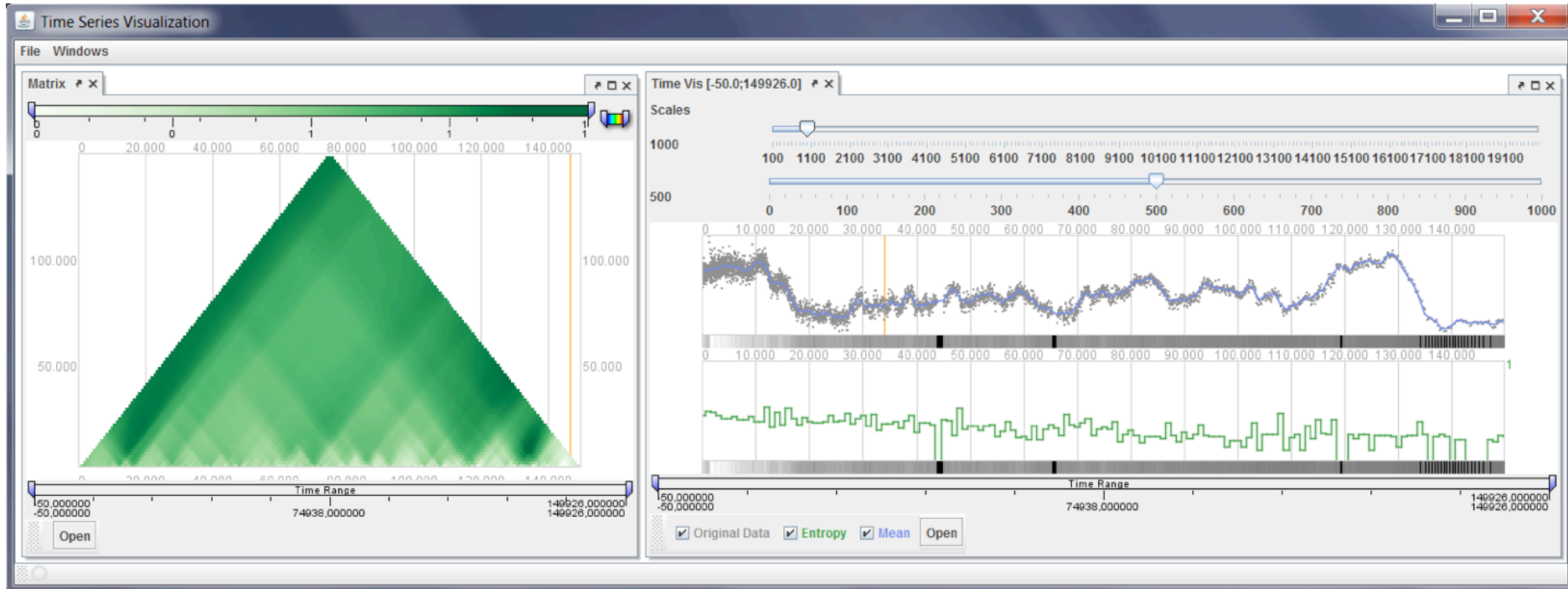
- Overview Visualization [Mean]



- Advantages?



# Interactive Exploration

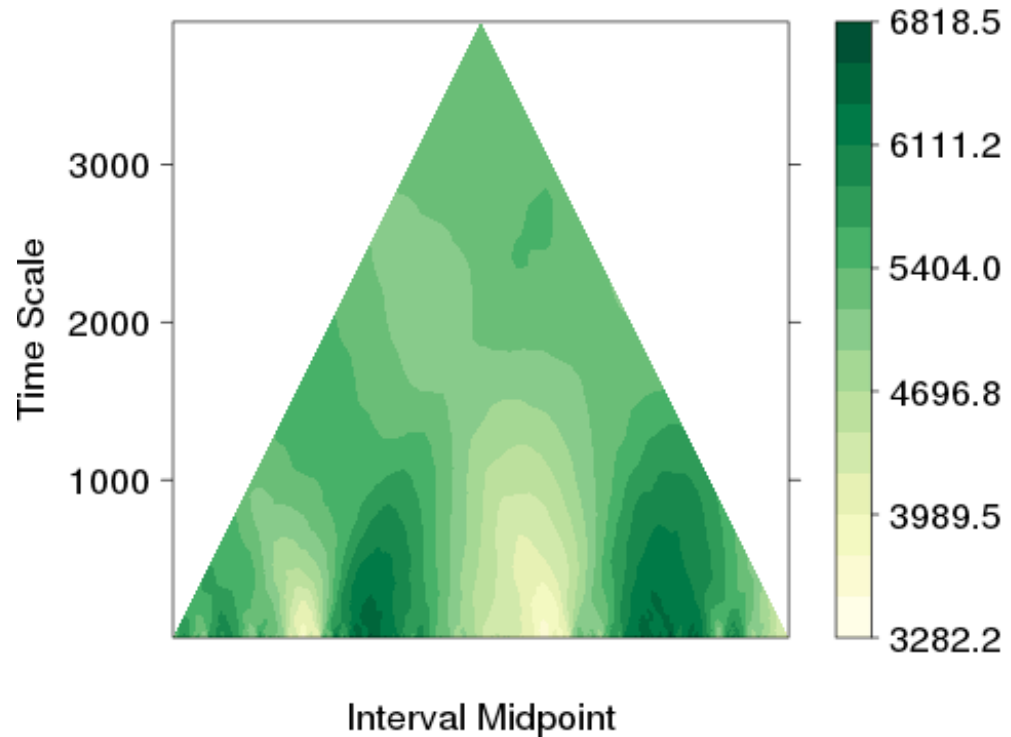


- Conclusion

# Conclusion

- Really hard to do something (useful) is hard
- Achieved success show the usefulness of Pinus approach
- Scientists use our tool in their daily work
  
- Research is recognized in community
  - Top 10 paper on Visual Analytics Science and Technology Conference
  - Paper published in IEEE Transactions on Visualization and Computer Graphics November/December 2012

# Thanks!



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*UK Stock Exchange Index (last 5 years)*