Outline

• Visual analytics approach
• Human cognitive abilities and limitations
• Current challenges
• Visual analytics scenario overview
What is Visual Analytics?

Visual Analytics is the science of analytical reasoning supported by interactive visual interfaces.

- Support the cognitive processes
- Deliver the knowledge
- Discover the relations and patterns
What is Visual Analytics?

Thomas, J., Cook, K.: Illuminating the Path: Research and Development Agenda for Visual Analytics
Application of Visual Analytics

• Moving from research to a widespread use

• Looking at the data from different perspectives

• Combining with computational processing

• Optimization of delivering knowledge
Human Cognitive Abilities

Increase of computing components performance

Human cognitive capability remain constant

How to reduce human cognitive weaknesses?

http://businessecon.org/2013/01/find-the-bottleneck/
Visual Analytics Systems

• Combination of mathematical, statistical, informatical, and linguistic analysis

Transforming data into

- clear,
- concise,
- human comprehensible visual representations.
Visual Analytics Scenario Overview
Methods & Techniques

- time scales statistical values computing, pattern visual identification, detected pattern exploration

Purpose

- detection of patterns in numerical time series

Data sets

- Earth’s climate system and ocean data
Scenario I.

Scenario II.

Methods & Techniques

- model setup verification, critical parameters estimation, parallel processing analysis, simulation results validation

Purpose

- decision-making process support in planning of treatment options for contaminated sites

Data sets

- nuclear contaminant data
Scenario II.

Methods & Techniques

- gridded binary format processing, parallel coordinates plots, voyage time graphs, geospatial data interaction

Purpose

- weather parameters visualization along ship routes

Data sets

- ship voyages data
Conclusions

• Goals and benefits of Visual Analytics

• Human cognition limitations

• Visual Analytics methods

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Thank you for your attention

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