Bachelorclass 2014-2015

Siegfried Nijssen

14 January 2015

Universiteit Leiden

Research at LIACS

Algorithms and Software Technology (AST)

- Data science (data mining, databases)
  Joost Kok
  Aske Plaat
  Jaap van den Herik
  Siegfried Nijssen
  Peter Lucas
  Stefan Manegold
  Erik Schultes
  Natallia Kokash
  Frank Takes
- Natural computing (evolutionary algorithms, genetic algorithms, multi-objective optimization)
  Thomas Back
  Michael Emmerich
- Search algorithms (games)
  Walter Kosters
  Hendrik Jan Hoogeboom
- Formal methods in computer science (automata, petri nets, models for parallelism)
  Marcello Bonsangue
  Jetty Kleijn
  Farhad Arbab
  Frank de Boer

Research at LIACS

Computer systems and Imagery & Media (CSI)

- Imaging, information retrieval
  Michael Lew
  Erwin Bakker
- Bioinformatics (imaging, pipeline tools, user interfaces)
  Fons Verbeek
  Kathy Wolstencroft
  Alexander Goultiaev
- High performance computing (compilers, parallelism)
  Harry Wijshoff
  (but also Farhad Arbab)
- Embedded systems
  Todor Stefanov

Data Science

- Siegfried Nijssen
  Machine learning, data mining, declarative solvers, artificial intelligence
  - Pattern mining in graphs
  - Declarative data mining, 4th generation languages for data mining
  - Inference in probabilistic models
  - Visualizations of patterns
- Erik Schultes
  Bioinformatics
  - 7-mer sequenome – data analysis
  - 7-mer sequenome – NK model of rugged fitness
  - SeDEx platform (sequenomics data exchang)
  - Anatomy of a concept profile
  - Trend analysis

Data Science

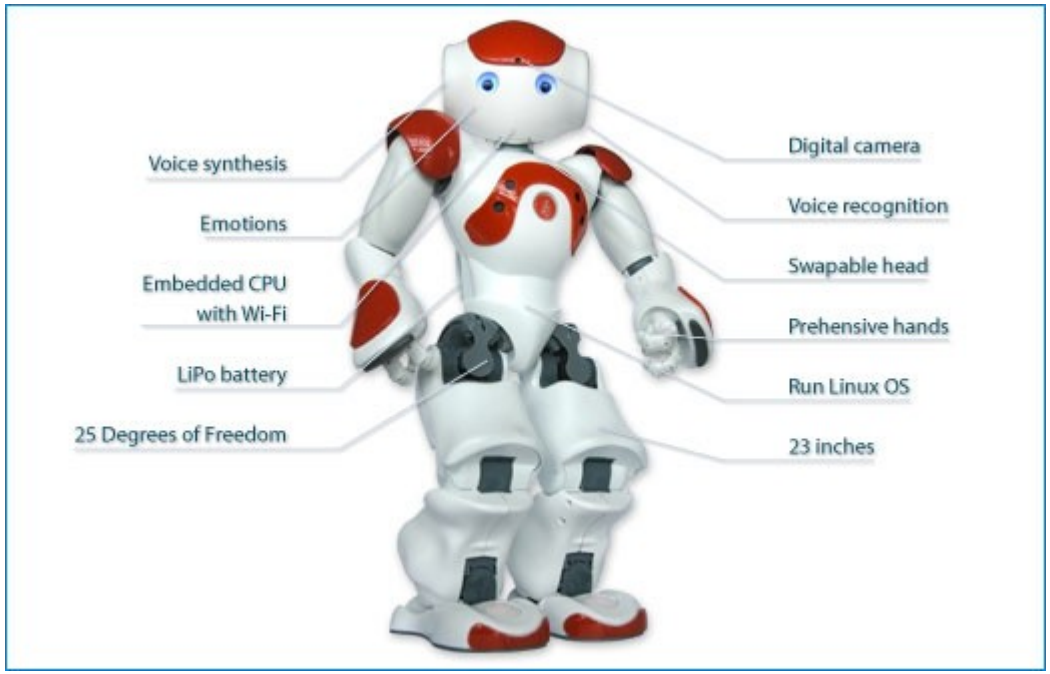
- Aske Plaat, Jaap van den Herik
  Applications of data science, Games
  - Augmented reality for the faculty of science
  - Applications of data mining in companies, government
  - **Computer game olympiad** ***icga.leidenuniv.nl***
- Peter Lucas
  Probabilistic, Bayesian models
- Stefan Manegold
  Databases
- Walter Kosters
  Games, Artificial Intelligence

Data Science

- Natallia Kokash
  Data visualization
  - Schematic views of human anatomy
  - Tree views of data
- Frank Takes
  Network and graph analysis
  - Comparison of graph processing frameworks

AI Opportunity

SeraSoft NAO Robot



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Natural Computing

- Michael Emmerich
  Multi-objective optimization, genetic algorithms, data science
  - Genetic algorithm for dimensioning distribution systems
  - Data mining and visualization of outdoor sports
  - Optimal selection of drug candidates in molecular databases
  - Finding drugs
  - Genetic programming for symbolic regression
  - Portfolios for geo-exploration
  - Machine learning for identifying how deep water is
  - Vehicle routing
  - SPAM filters based on compression or evolutionary computation
  - Building design in 4D
  - 4D pareto fronts in 3D
  - Landscapes of complex codes (bitcoin)
  - Patterns in networks
  - From biological evolution to evolutionary algorithms
  - Sampling based robust optimization
  - Multi-objective optimization with limited budgets
  - Diversity optimization

Multimedia

- Michael Lew
  Recommendation systems
  - Video recommendation
  - Social sentiment analysis
  - Social trend analysis
  - Ranking for Wikipedia
  - High performance search engines
  - Image search
  - Image search in 3D

Bioinformatics

- Katy Wolstencroft
  Workflow systems

- Fons Verbeek
  Analysis of biological images

- Alexander Goultiaev
  Sequence analysis, folding

Formal Methods and Software

- Jetty Kleijn
  Petri nets
  - Pimp pipe, tool for theory of concurrency
  - Set nets, biologically motivated petri nets
  - Structured occurrence nets, changing nets
- Marcello Bonsangue
  Formal methods, automata and formal languages
  - Find equations satisfied by an automaton
  - Parsing trees from derivatives
  - Extend a guarded language with recursion
- Farhad Arbab
  Coordination languages
- Frank de Boer
  Software correctness
- Bilal Karasneh
  Analysis of UML diagrams
  - Recognize pictures of UML diagrams

Computer Systems

- Kristian Rietveld
  Optimizing compilers, efficient code execution
  - Fast evaluation of equations in computational mechanics
  - Reorganizing loops for better memory access
  - Compiler transformations: parallellisation and benchmarking of algorithms, improving algorithms
- Todor Stefanov
  Embedded computing
  - Automatic code parallelisation
  - Mapping code to multi-processor systems on chips
- Raphael Poss
  Simulation of systems
  - A GUI for MGSIM
  - Virtual input devices for MGSIM