A Machine Learning Perspective on Predictive Coding with PAQ

Presentation by Phil Trommer

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Überblick

What is PAQ8

- What is it?
- How does it work?
- What makes it so famous?

Matt Mahoney

- Born 1955
- Recieved Ph.D in computer science at Florida Tech in 2003
- Released PAQ1 on January 6, 2002

Introduction to PAQ

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What is PAQ?

- A lossless, open-source compression algorithm
- Brings high perfomance at the cost of increased memory usage and time consumption
- Related to PPM, is envisioned as PPMs improvement

4

Principles of PAQ

- Modeling combined with adaptive arithmetic encoding
- Open to additions and improvements
- Improves perfomance of PPM by including several predictors (i.e. models of data)
- Combines the result of the predictors

Exemplary Predictors

The order-n context predictor

- Test

Exemplary Predictors

The order-n context predictor

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The sparse context predictor

- Test

Observation 1

Simmons Hall is composed of metal and concrete.

Observation 2

Simmons Dormitory is composed of brick.

Conclusion

Simmons Hall $\neq$ Simmons Dormitory.

1. Bla
2. blub