COMPUREG

DAR

Bayesian Decision Support for Industry: Application Themes

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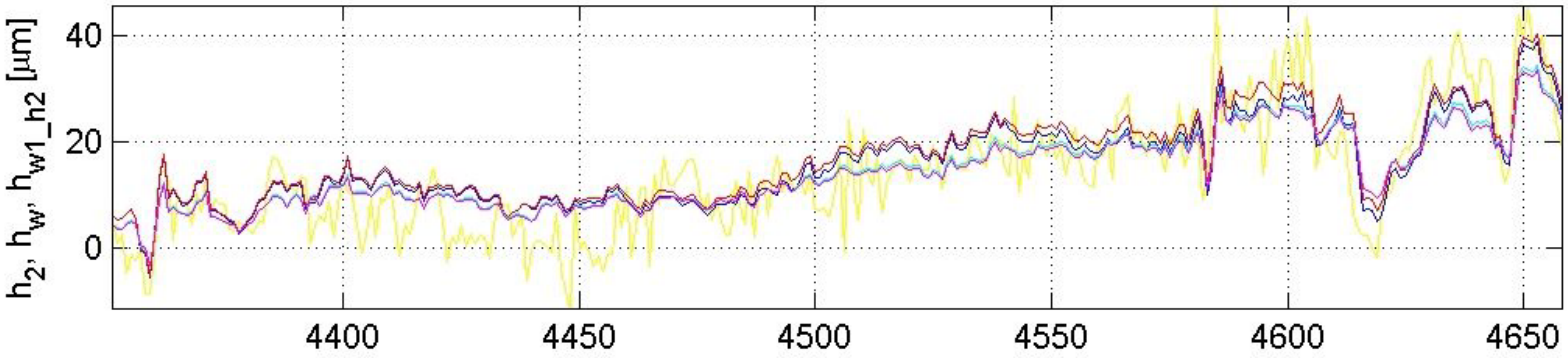
Main themes

- **Decision support for operators of industrial processes**

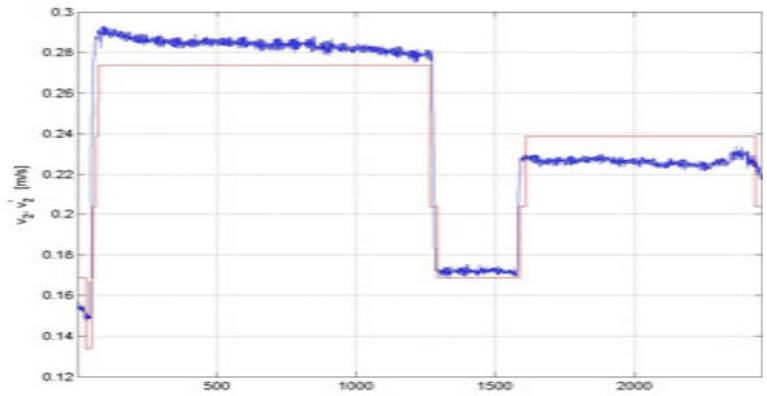
- **Selection from a set of process models / model mixing**

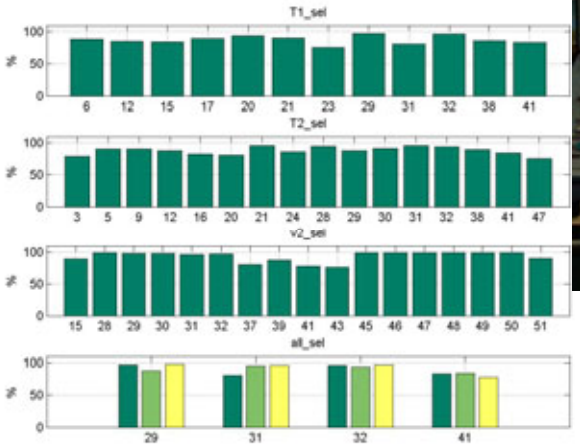


Decision support for operators in industry (1)

Applied for the rolling mill in KOR - adjustment of key process variables

- Continuation of research started by the EU project ProDacTool
- New versions of algorithms, new data, various settings of the system
- Comparison of operator settings with recommendations generated by the system
- Criterion of success - relative matching
- Testing in winter / spring 2006
- Report available on the DAR web pages

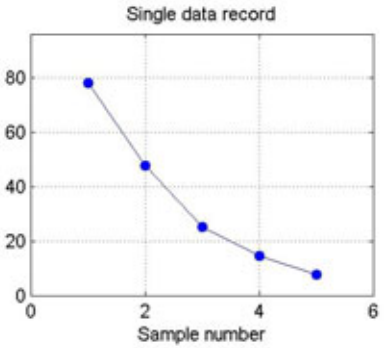


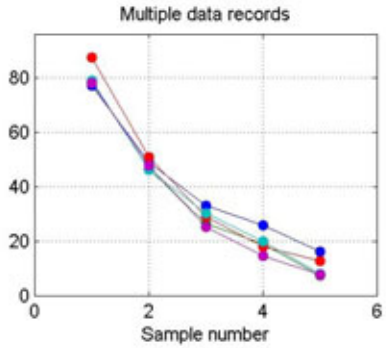


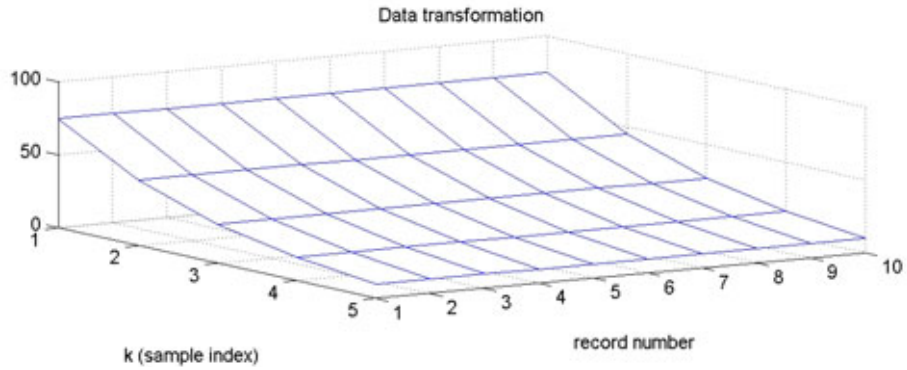
Mixing of process models

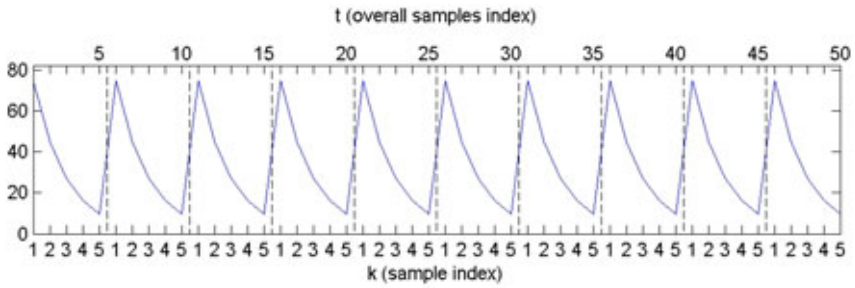
Identification from short records

- **Multiple short records from industrial (or medical) applications**
- **Difficult for single records → merging → mixture identification**
- **2 methods of data arrangement**





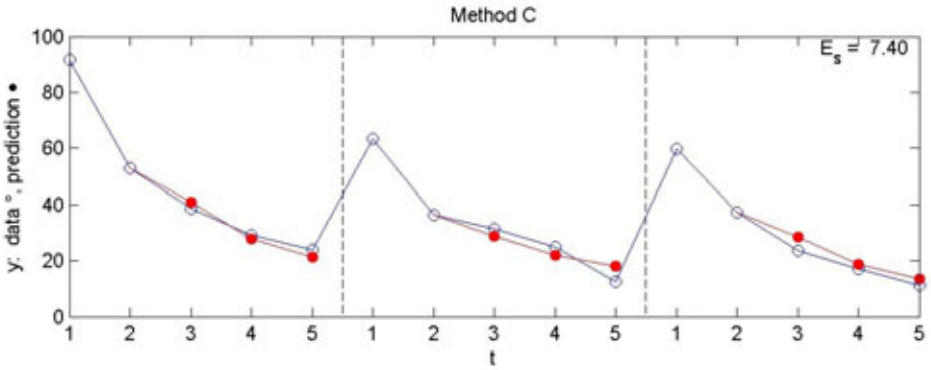


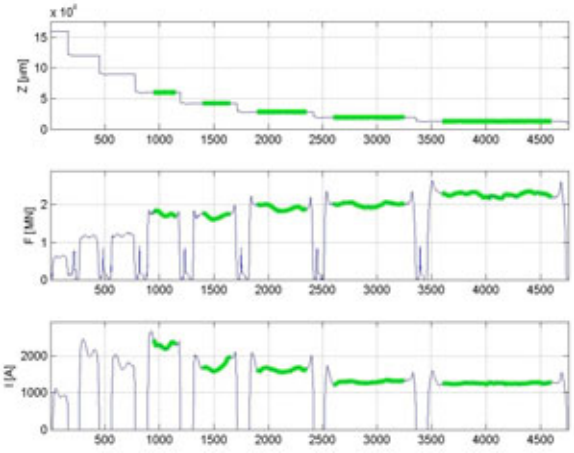


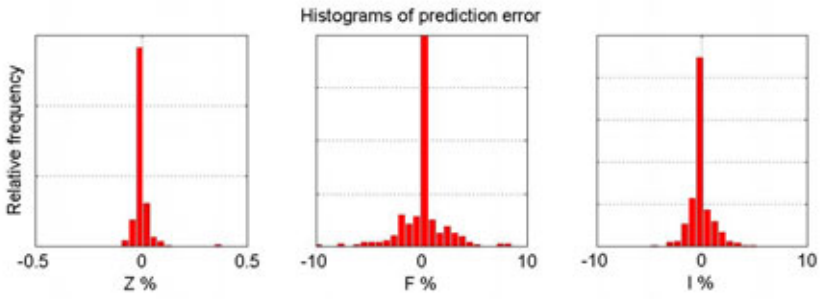
Mixing of process models (cont.)

Predictions from short records

- **Selection of mixture components (model mixing) for usable prediction**
- **Elimination of components which model transitions among records**
- **Several methods, dependent on data**
- **Presented on ICINCO conference, DAR pages**



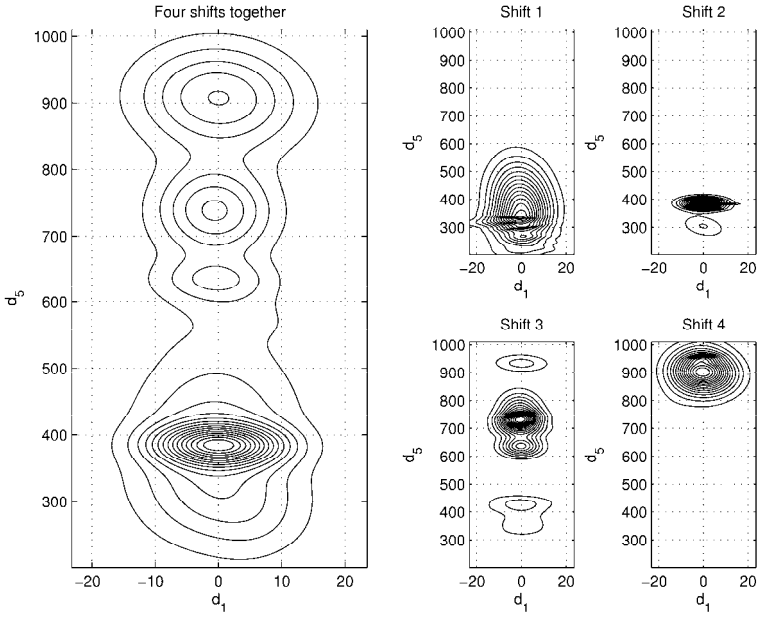


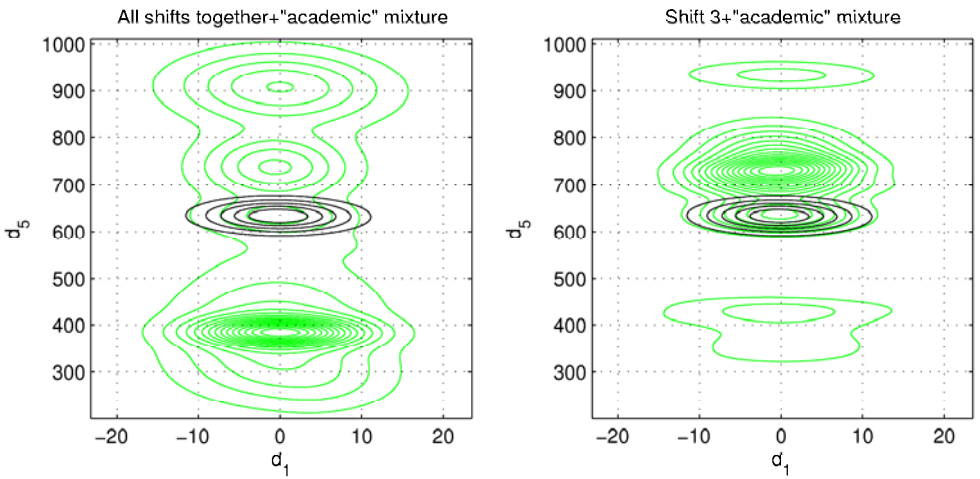


Decision support for operators in industry (2)

Evaluation of working shifts

- **4 groups of operators alternate in three-shift operation**
- **Statistical comparison trivial but unfair (unequal conditions)**
- **Conditioned probabilistic evaluation**

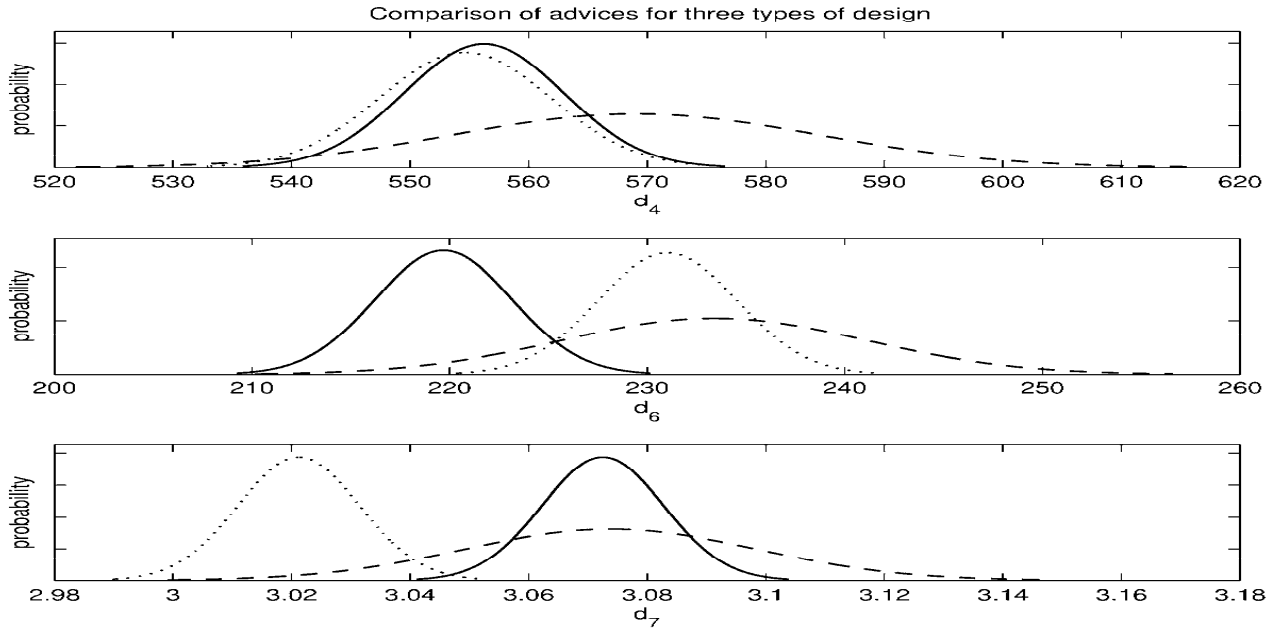




Decision support for operators in industry(2-cont.)

Optimization of working shifts

- **Optimization I: demanding orders realized by the best shift**
- **Optimization II: the best shift "learns" the others its settings**
- **Optimization III: optimal recommendation to all shifts**



Report in progress

To be done

- **Exploitation of the testing potential of KOR**
- **Another round of experiments with new algorithms**
- **Off-line experiments with data from other rolling mills**
- **Selection of models, weighted predictions**