KU LEUVEN

Sportconstraint Learning using Tensor Data

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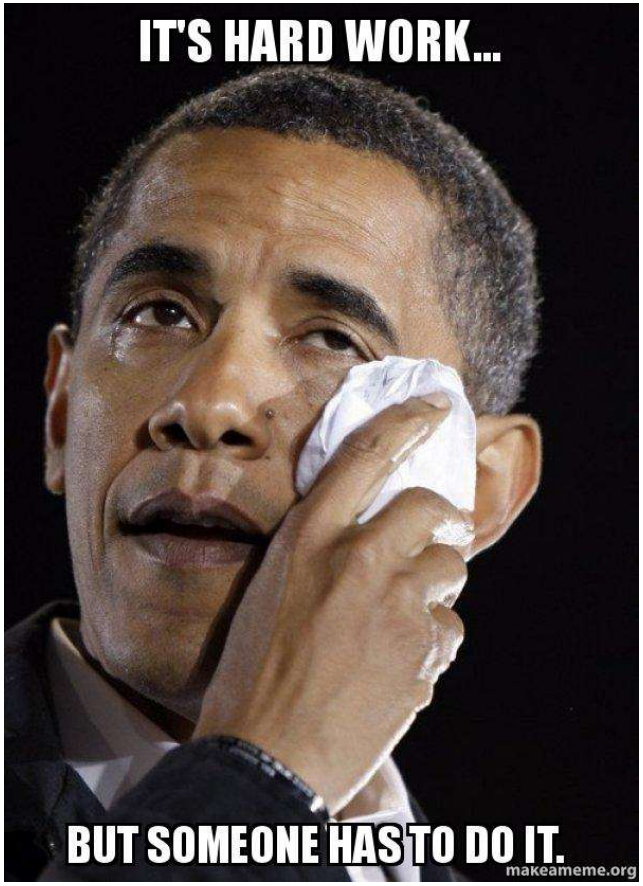
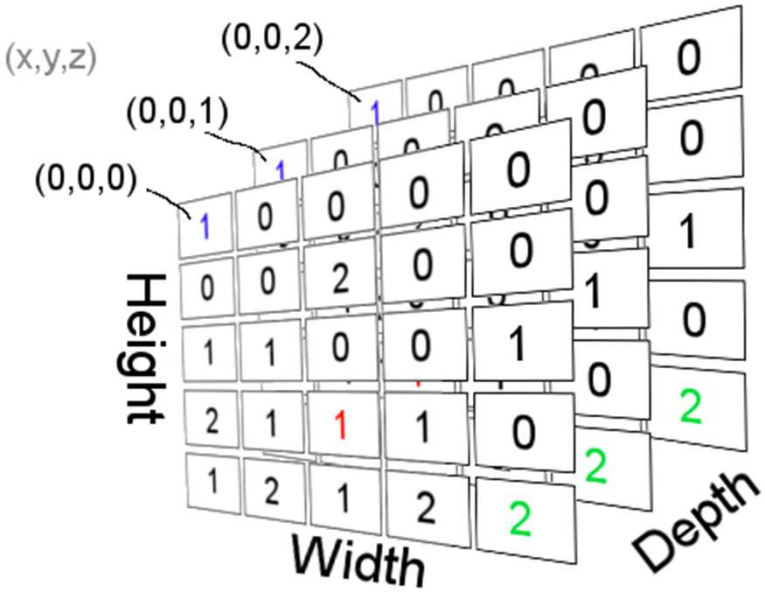
Context

- Many real world problems require constraints
- Sport scheduling is really complex and laboursome
  - 2 leagues
  - Each league consists of 3 divisions
  - 162 games per team per regular season
- Could this be automated to lower the amount of work?



Aim

- Constraint programming to make scheduling easier
  - Learning/acquiring constraints using tensor manipulation
  - Make schedule problems easier
    - Particular interest in sports!

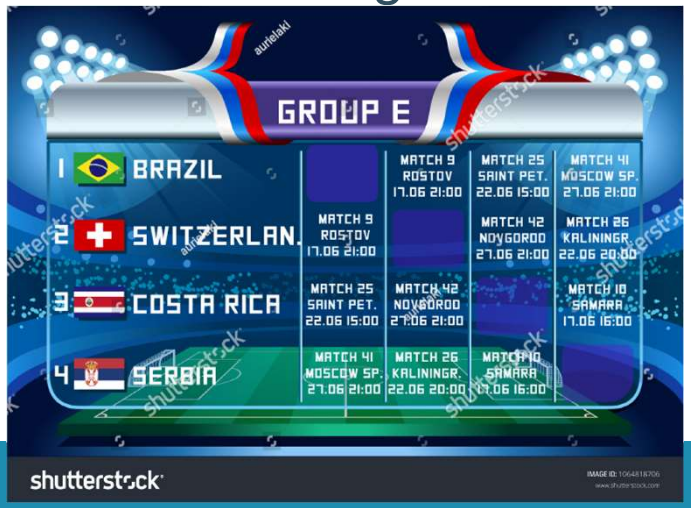


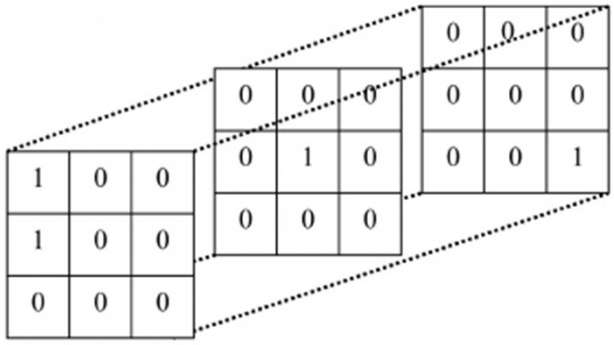
Approach: Literature study

- Different kinds sport schedules? Terminology?
  - X-Round Robin
- Cost functions
- Sport scheduling hard / soft constraints?(Nurmi et al.)
- Previous work on sport scheduling?
  - Traveling tournament problem
  - Modelseeker

Approach: Research Questions

- What could we learn from using CountOR as is?
- Could we adapt/generify CountOR to CountSPORT to learn scheduling constraints?
  - To what extend can we acquire all constraints?
- Could we integrate minimizing/maximizing cost functions into CountSPORT?





Practical approach: CountOR(benchmark)

- Generate set of schedules using own constraints
  - D
  - D
  - D
- Learn with CountOR as is
  - Generate new set schedules using acquired constraints
  - Satisfy?

Practical approach: CountSPORT

- Adapt CountOR
  - Hard constraints
  - Soft constraints?

Putting it to work: a practical use case

- Scheduling the Belgium football competition (format used since 2009)
  - 16 teams: 30 games in regular competition
  - Playoff 1: Division of 6 teams
  - Playoff 2: 2 divisions of 4 teams
  - Playoff 3: 1 division of 2 teams
- Lots of edge cases