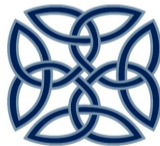
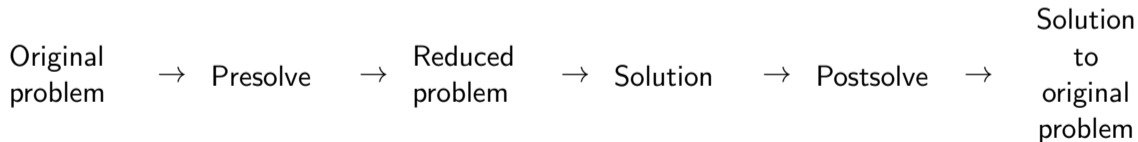


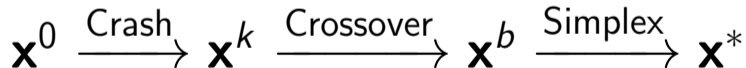
- Ivet Galabova
  - PhD Student
  - Consultant Mathematical Programmer
- Supervisors
  - Julian Hall
  - Jacek Gondzio
- Topic
  - Linear Programming



- Large numbers of variables and constraints
- Matrices are generally sparse and generated by a modelling program
- Redundancies present
- Reducing the dimension of the problem generally makes it easier to solve



- A good starting basis is essential for the solution of large problems
- The Idiot crash is a heuristic aiming to improve feasibility
- Implemented by John Forrest in CLP
- Seeking primal feasibility prior to primal simplex



- Quadratic penalty methods for LP
- Solve a series of unconstrained problems
- For  $k = 1, 2, \dots$

$$\min \quad \mathbf{c}^T \mathbf{x} + (\mathbf{Ax} - \mathbf{b})^T \boldsymbol{\lambda}^k + w^k \|\mathbf{Ax} - \mathbf{b}\|^2$$

- parameters  $w^k, \boldsymbol{\lambda}^k$
- $w^k \rightarrow \infty$  as  $k \rightarrow \infty$
- $\boldsymbol{\lambda}^k \rightarrow \mathbf{0}$  as  $k \rightarrow \infty$
- $\{\mathbf{x}^k\} \rightarrow \mathbf{x}^*$  as  $k \rightarrow \infty$

- Cargill
  - Animal feed formulation
  - Mixed integer programming problems
  
- The Zuse Institute Berlin (ZIB)
  - Research institute for applied mathematics
  - Mixed integer programming problems

