Forecasting the trajectories of slow-progressing mobility diseases following medical interventions

**Motivation**
- Cerebral palsy → long-term evolution
- Alleviation by surgery
- Objective: **Quantify surgery outcome**
- Input: patient history
- Target: Gait Deviation Index [0, 100]

**Discriminative ML**
- Lin. Reg, Random Forest, Naïve Bayes
- Shallow NN: 20, 10 nodes & ReLu

**Discrete Bayesian Network [1, 2]**
- Discretization
  - Quart/Terciles → GDI: [45-50]...
- MLE

**LGBN results & EM**
- Train set size
  - MSE: 35, 40, 45
  - 1-step: 2250, 1150, 2250
- 2-step, 3+ visits
- 2-step + EM

**“Small” RNN**

**Data**
- 6000 visits x 2 sides → mean
- Irregular time
- 80% surgery: 10 categories → 0/1

**Processing**
- Correlation threshold → 10 variables
- 1-step: $GDI_{pre}, Surgery → GDI_{post}$

**Linear Gaussian BN [4]**
- New features
  - 10 variables
  - 1-step vs 2-step
  - Δ time
  - Del. missing data

**Results summary**

**References**
[1]: Senen et al., Bayesian Networks for Clinical Decision Support in Lung Cancer Care, PLOS one, 2013
[2]: Watt et al., Evaluation of a DBN to Predict Osteoarthritic Knee Pain from OAI Data, AMIA 2008
[3]: Choi et al., A Hybrid BN for Predicting Breast Cancer Prognosis, Kor Soc Med Informatics 2009