Machine Learning Advanced Pipeline

November 2019

Introduction to the problem

Introduction i

We want to deploy a Machine Learning web service that predicts whether a person has an abnormal spine.

Introduction ii

Lower back pain can be caused by a variety of problems with any parts of the complex, interconnected network of spinal muscles, nerves, bones, discs or tendons in the lumbar spine. Typical sources of low back pain include:

Introduction iii

- The large nerve roots in the low back that go to the legs may be irritated.
- The smaller nerves that supply the low back may be irritated.
- The large paired lower back muscles (erector spinae) may be strained.
- The bones, ligaments or joints may be damaged.
- An intervertebral disc may be degenerating.
- An irritation or problem with any of these structures can cause lower back pain and/or pain that radiates or is referred to other parts of the body.
- Many lower back problems also cause back muscle spasms, which don't sound like much but can cause severe pain and disability.

Introduction iv

While lower back pain is extremely common,
the symptoms and severity of lower back pain vary greatly.
A simple lower back muscle strain might be excruciating enough to necessitate an emergency room visit, while a degenerating disc might cause only mild, intermittent discomfort.

This data set is about to identify a person is
abnormal or normal using collected physical spine details/data.

Attributes: Pelvic incidence, pelvic tilt, lumbar lordosis angle, pelvic radius, sacral slope, degree spondylolisthesis, pelvic slope, direct tilt, thoracic slope, cervical tilt, sacrum angle, scoliosis slope, LABEL.

[Source].

Use cases

Use cases i

- Mandatory:
  - Given the measurements of a back, predict the class to which the back belongs using an online Machine Learning model.
  - Store and list all the predicted cases.
- Extra:
  - Creatively implement new uses cases.

Technologies

Technologies i

- Machine Learning model
- Web service

Machine Learning model i

- Data Collection
- Data Preparation
- Choose a Model
- Train the Model
- Evaluate the Model
- Parameter Tuning
- Make Predictions

Web service i

- Docker
- API REST
- Database