Ortho Eyes

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Business IT & Management

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Applied Mathematics

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Background

Physiotherapists and doctors help with the recovery of patients after chirurgical procedures. To determine the optimal treatment for the patients it is important to measure the range of motion (RoM) of a patient's limbs quickly and accurately.

Leiden University Medical Center has an 'Flock of Birds'-system that can accurately measure the RoM of a patient's limbs. The system is used for research but the system was never used to determine a patient's current medical condition because it isn't certain this is possible.

Other research papers also suggest researching the RoM of a patient's limbs for diagnostic purposes:

"Due to our cross-sectional study design, future studies should investigate whether kinematic analyses of shoulder motion are useful for diagnostic purposes. A next step in our research would be to investigate the kinematics in subjects without RC disease and to investigate how kinematics change during life." (Kolk et al., 2017)

Background

It's about:

- recovery of patients with shoulder problems after chirurgical procedures
- measurements of the **range of motion** (RoM)
- the '**Flock of Birds'**-system of the LUMC that can accurately measure the RoM.

Other research papers suggest researching the RoM of a patient's limbs for diagnostic purposes:

"investigate whether kinematic analyses of shoulder motion are useful for diagnostic purposes." (Kolk et al., 2017)

Our Client

Dr. ir. J. H. (Jurriaan) de Groot

Hoofd Research and Development

Vakgebied(en)

- Innovatie in diagnostiek en behandeling (Centraal neurologische & Neuromusculaire aandoeningen, Schouderpathologie)
- Hoofd Laboratorium voor Kinematica en Neuromechanica (LK&N)
- Blokcoördinatie Technische Geneeskunde

The project

Project goals:

Is it possible to:

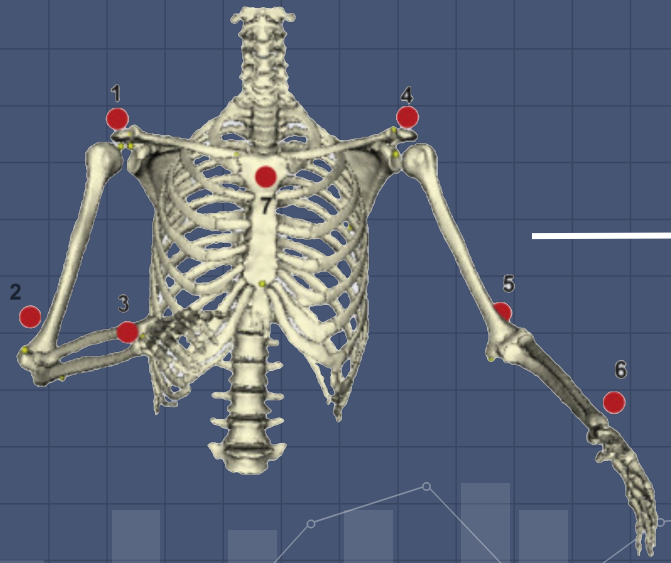
1. Find patterns and/or structures
2. Determine a patient's groups

From the data of measurements made by the 'Flock of Birds'-system

For us as students to learn as much as possible about data-science

The project

The Leiden University Medical Center's 'Flock of Birds'- system



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28	0,16756753	-5,65012765	-5,92207778	-42,5225098	20,2874429	27,9453246	23,4167771	26,8375936	-18,4482978	7,20794282	107,8
29	0,16756753	-5,65012765	-5,92207778	-44,6454535	21,0527569	32,9897027	23,8771776	29,6682369	-18,4390222	7,58216701	111,92

1 measurement = (30 x 107 rows)

What have we achieved?

- Practiced Python with DataCamp
- Set up an project environment: (Trello, GitHub, Google Drive, WhatsApp)
- Gained insight about context and goal of project by reading literature
- Received a first data sample

What have we planned?

- **Filling a first product backlog**
- Continuing the DataCamp courses
- Receiving the full data-sets
- Reading more literature to gain more insights in the context

The problems we face or expect to face

- Our client is very busy
- Difficult and time-consuming literature
- Unfamiliar with medical jargon
- Insufficiënt knowledge about structure of data

A question for you..

Any questions or suggestions?