a system for analysis of the 3D mandibular movement

FEUP
Isa Teixeira Santos
João Manuel R. S. Tavares
Joaquim Gabriel Mendes

FMDUP
Manuel Pedro da Fonseca Paulo
outline

- clinical problem:
  temporomandibular joint
  mandibular movement

- our solution:
  technology adopted
  prototype developed

- business potential
  market
  competition
clinical problem: tempomandibular joint

Problems
- Esthetics
- Unequal development of the muscles
- Wear of the teeth
- Loss of teeth
- Articulation pain
- Cervical pain
clinical problem: tempomandibular joint

- Ear pain
- Articular noises
- Myalgies in the masticator muscles
- Anomalies in the mandibular movement
Clinical problem: mandibular movement

Projection on the Sagittal Plan

Projection on the Horizontal Plan
our solution: technology adopted

Three electromagnetic sensors are used for the 3D movement acquisition

A magnet piece is positioned inside the patient mouth
our solution: prototype developed

The facial arc Arcus, from Kavus, is used as the main support structure.
our solution: prototype developed

- Redesign of the auricular pieces of the facial arc *Kavus*
- Materialization of the new pieces done by rapid prototyping
Materialization of the support for the electromagnetic sensors done by rapid prototyping.
our solution: prototype developed

Acquisition device and power source used in our prototype

the collaborative innovation network
our solution: prototype developed

Software developed in *LabView* to visualize and analyze the 3D movement acquired in a PC

*the collaborative innovation network*
**our solution: prototype developed**

Prototype system developed and fully functional

www.i-techpartner.eu
business potential: market

- Medical dental doctors
- Developers of dental prosthesis devices
- Virtual reality designers
Actually there are few commercial systems for the same purpose; however, they are very complex to use and with a high cost.

Main vantages of the developed prototype:
- Integrated solution
- Adaptable to usual facial arcs
- Easy to use
- Not hard demanding in the environment conditions
a system for analysis of the 3D mandibular movement

FEUP
Isa Teixeira Santos
João Manuel R. S. Tavares
Joaquim Gabriel Mendes

FMDUP
Manuel Pedro da Fonseca Paulo

Thank you very much for your kind attention!