

# Data-driven modelling of pelvic floor muscles dynamics

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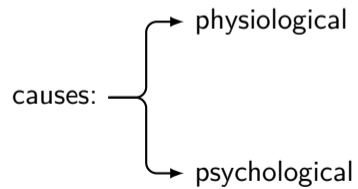
Reinhilde Melles & Marieke Dewitte  
*Maastricht Universitair Medisch Centrum*

June 19, 2018  
Reglermöte

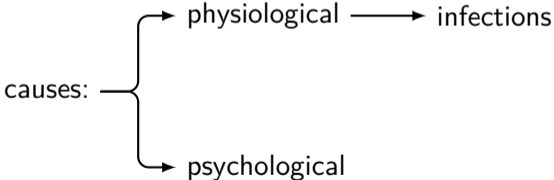
# Motivations

can we help improving the treatments related to dyspareunia?

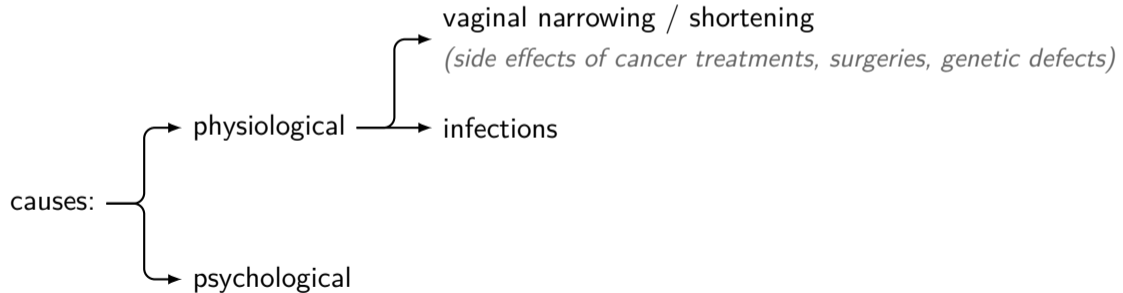
# Etiology



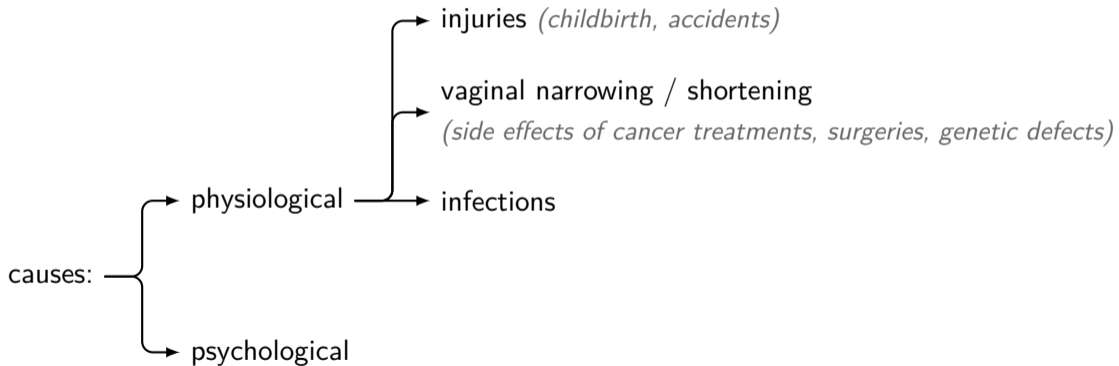
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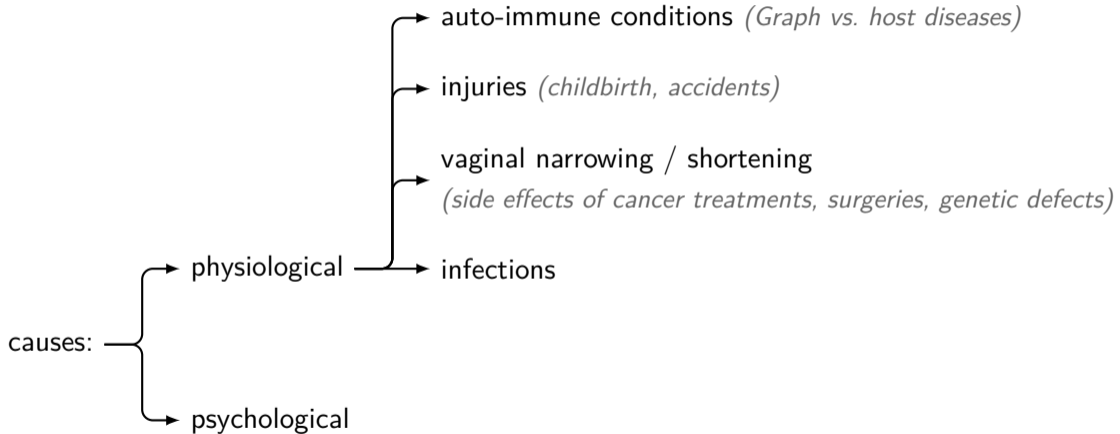
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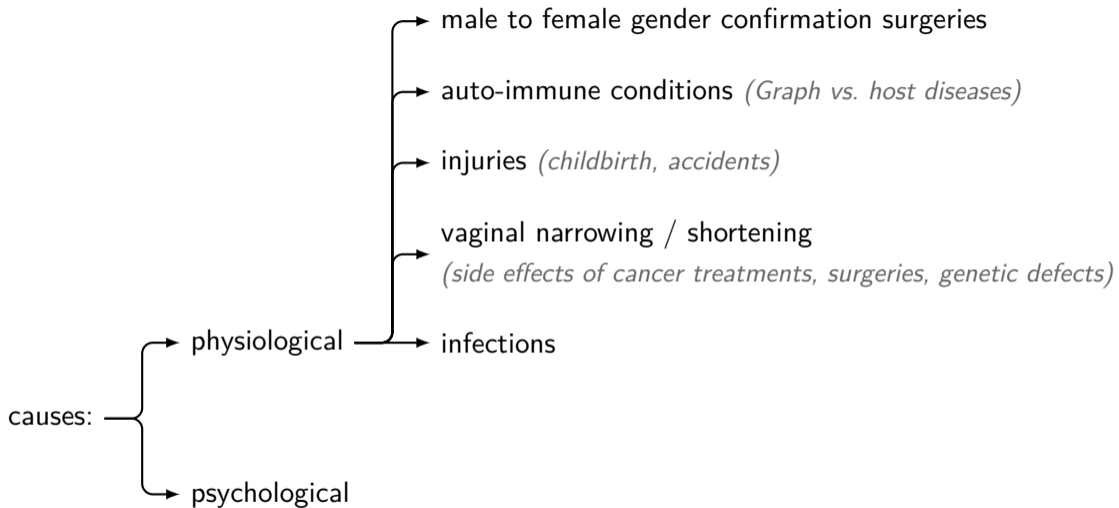
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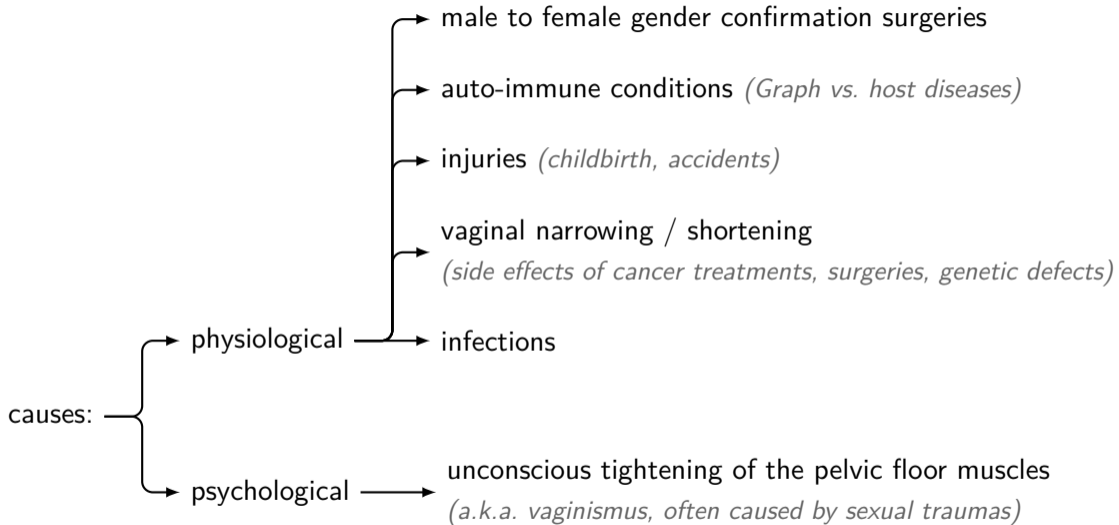


# Etiology





# Etiology



## Relevance of dyspareunia

*approximately 15% of women<sup>1</sup> in a variety of age groups*

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<sup>1</sup>Hayes, Bennett, Dennerstein, Taffe & Fairley, “Are aspects of study design associated with the reported prevalence of female sexual difficulties?”, *Fertility and Sterility*, 2008.

# Relevance of dyspareunia

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Indirect effects:

- self-shaming
- self-blaming
- isolation
- negative effects on patients' families and friends

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## How is it treated today?

gender confirmation surgeries

auto-immune conditions

injuries

vaginal shortening / narrowing

infections

vaginismus

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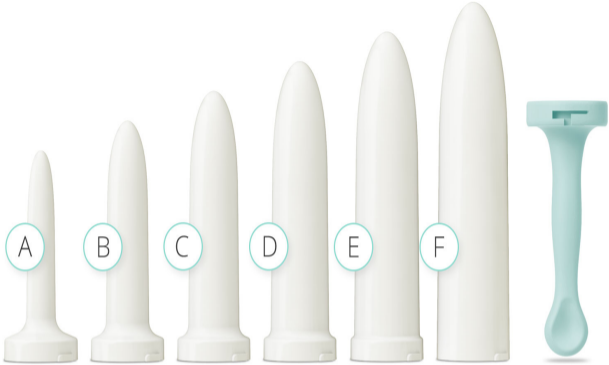
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up to .6" (15mm)	up to .88" (22mm)	up to 1.04" (26mm)	up to 1.19" (30mm)	up to 1.35" (34mm)	up to 1.5" (38mm)
Length	Length	Length	Length	Length	Length
3.48" (88mm)	3.97" (101mm)	4.46" (113mm)	4.95" (126mm)	5.45" (138mm)	5.96" (151mm)

Universal handle fits all sizes

+ counterconditioning

# Side effects

*“uncomfortable”, “shameful”*



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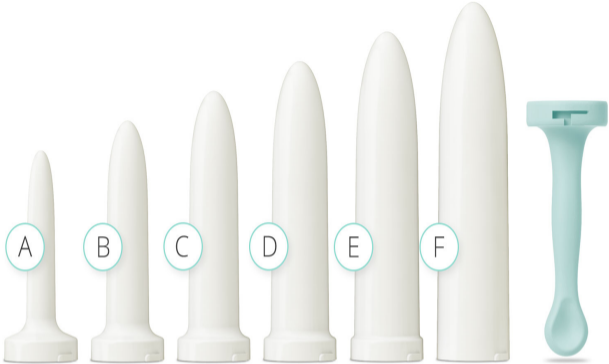


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leads often to dropouts



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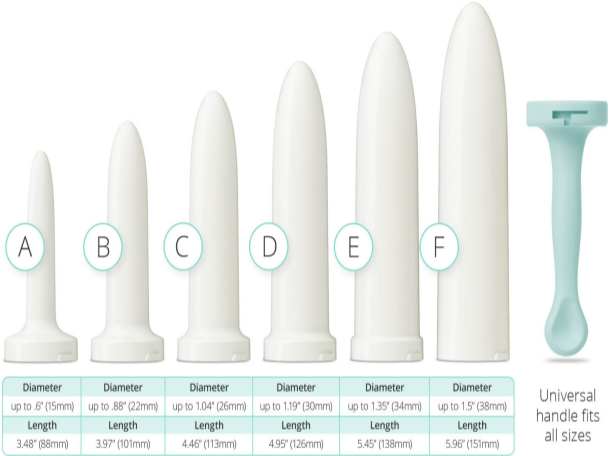
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needs better treatments



# Side effects

*“uncomfortable”, “shameful”*



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needs better treatments



needs better understandings



## Our contributions, in this talk

help understanding the physiological response  
to vaginal dilation stimuli

Our contributions, in a broader perspective

help developing novel dilators and dilation strategies

## Our contributions, in a broader perspective

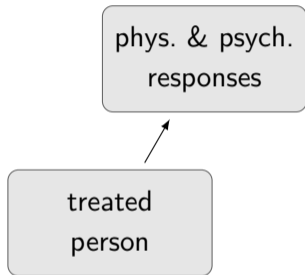
help developing novel dilators and dilation strategies



treated  
person

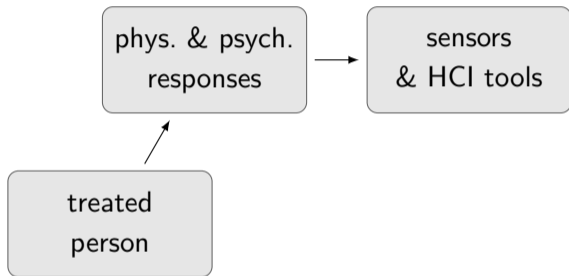
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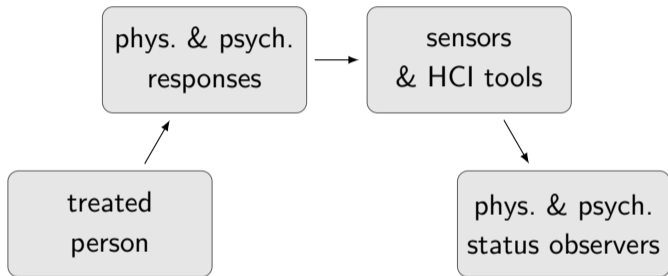
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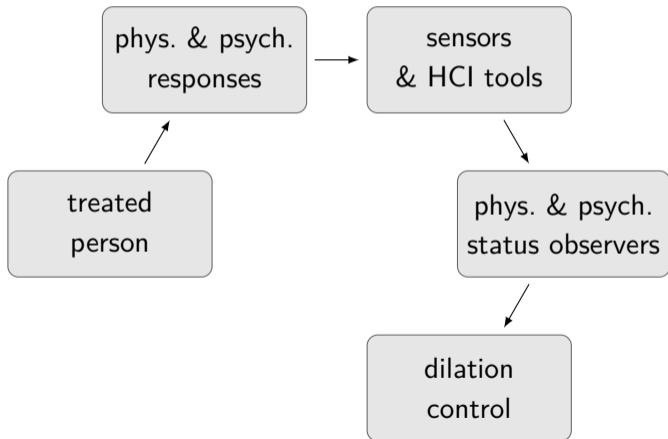
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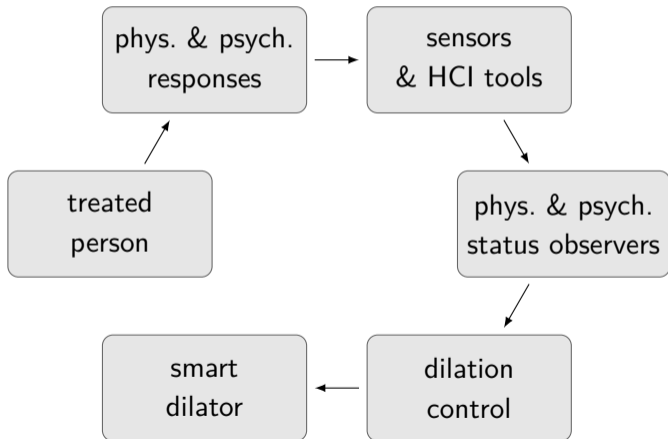
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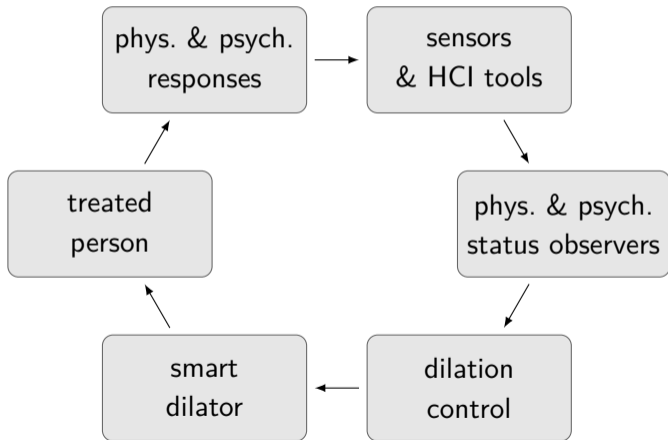
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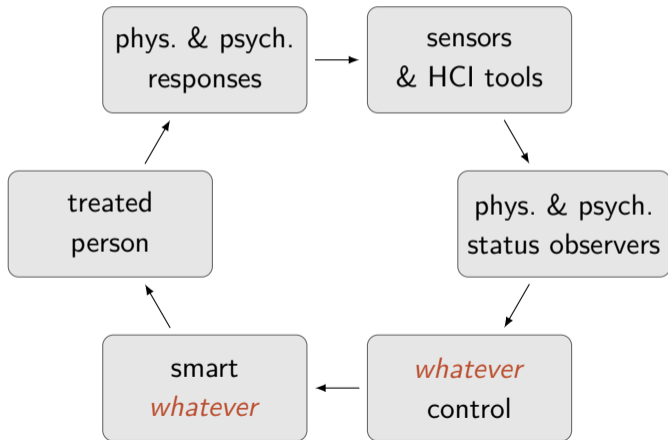
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## Our aims, in an even broader perspective

help accounting for psychological effects in medical treatments

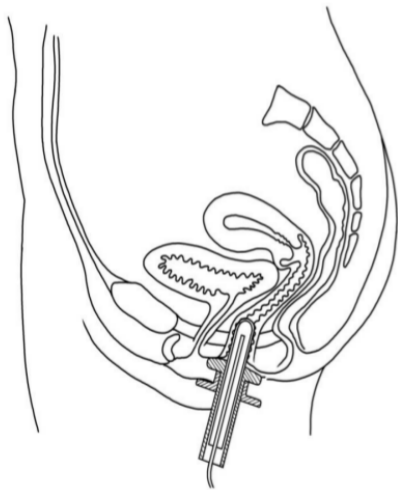


towards *psycho-physiological systems*

This talk...

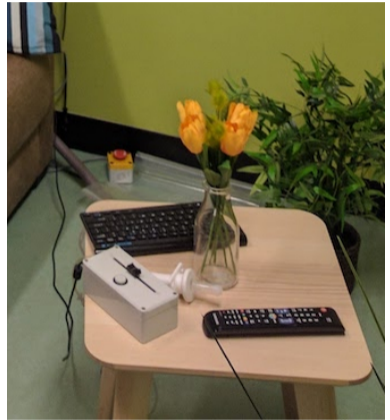
data-driven modelling of pelvic floor muscles dynamics

## Brief description of the medical trial

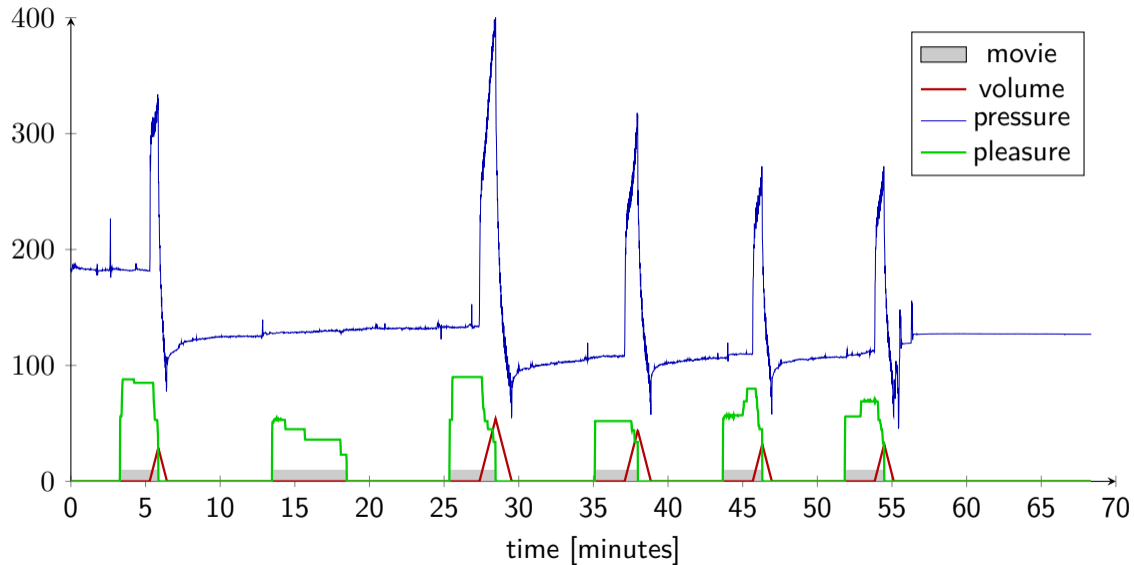




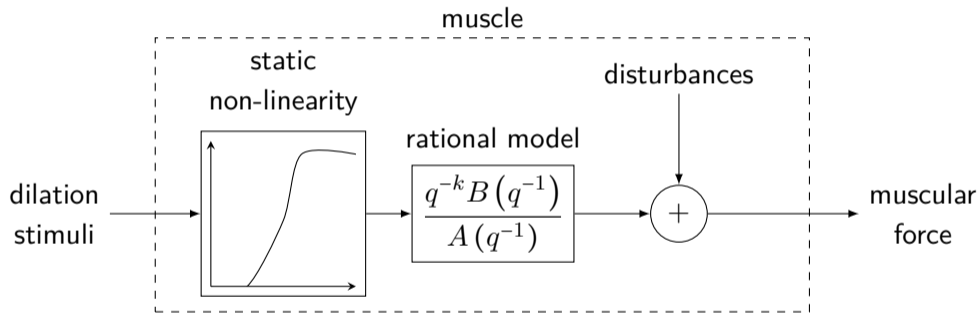
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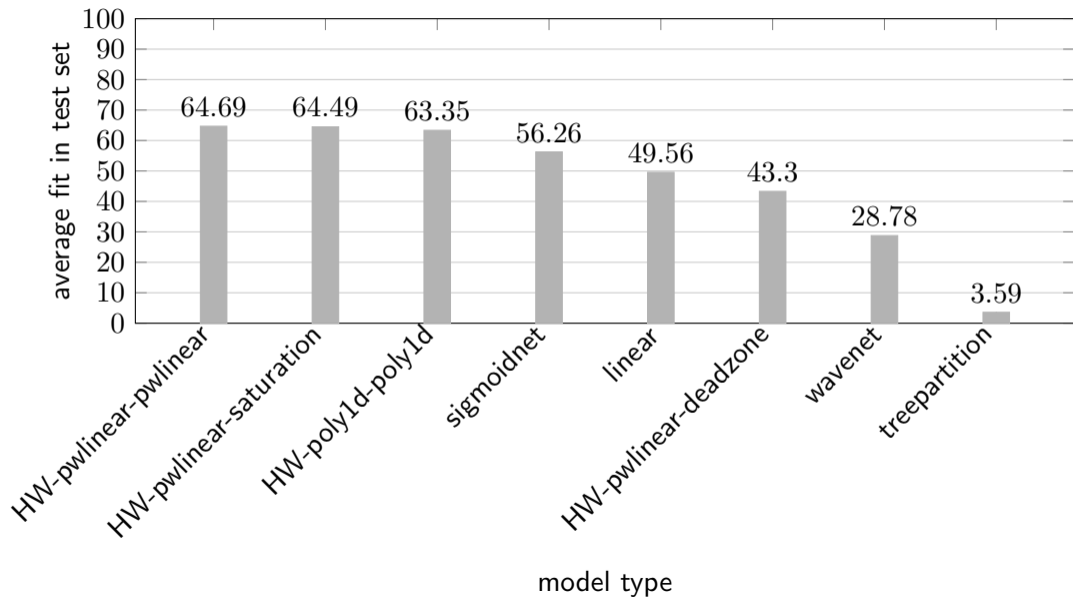
## A typical dataset



## Our modelling approach



## The results of our sysid efforts, in a nutshell



# Conclusions

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- 3 this is just a first step



## Conclusions and future directions

- 1 control engineers can contribute to this area
- 2 it is definitely a non-trivial socio-psycho-physiological system
- 3 this is just a first step

*right now:*

- starting “*PAIGE -Pelvic floor activation through gamified exercising*”

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