

Welcome
on board

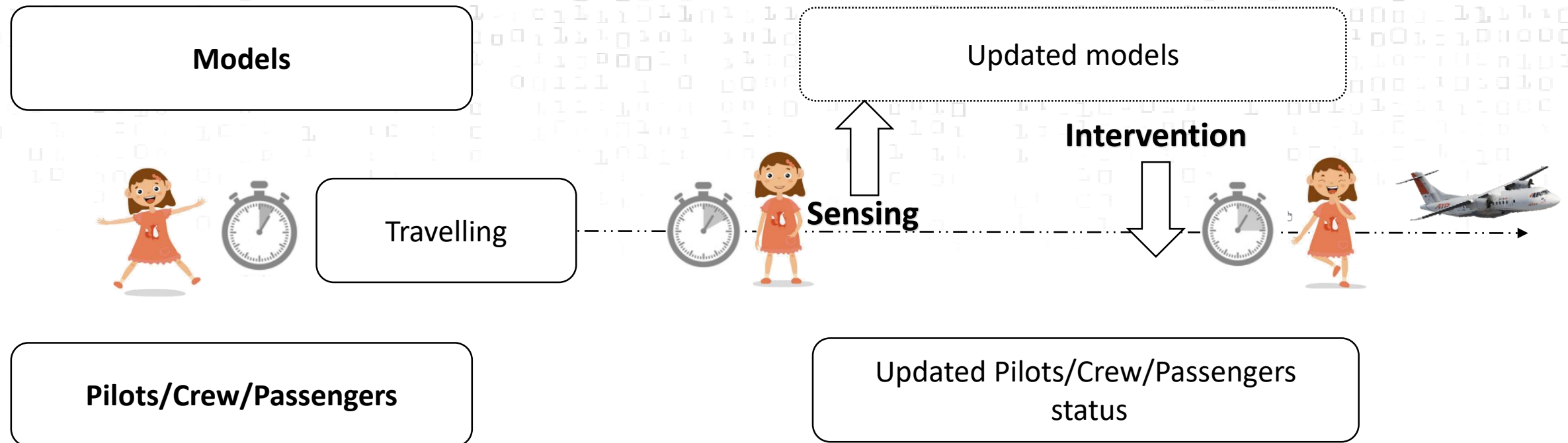


The digital twin of the humans in the cabin

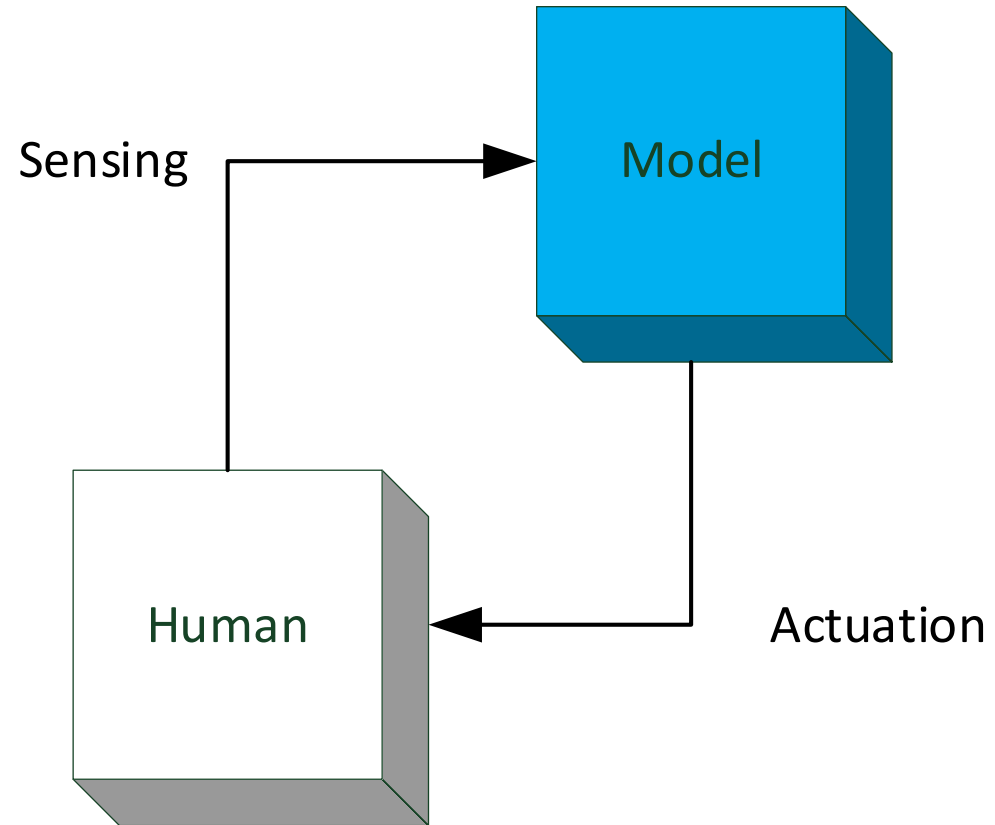
Wolf Song, Peter Vink

IO, TUD

The digital twin of human



A simplified representation



Anthropometric model



More accurate

Statistical shape models

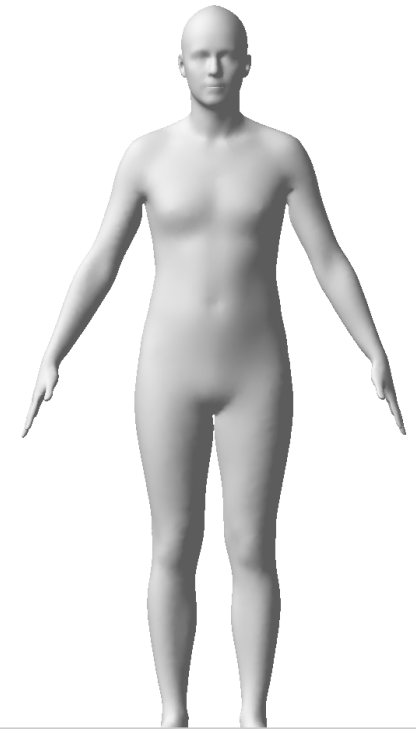
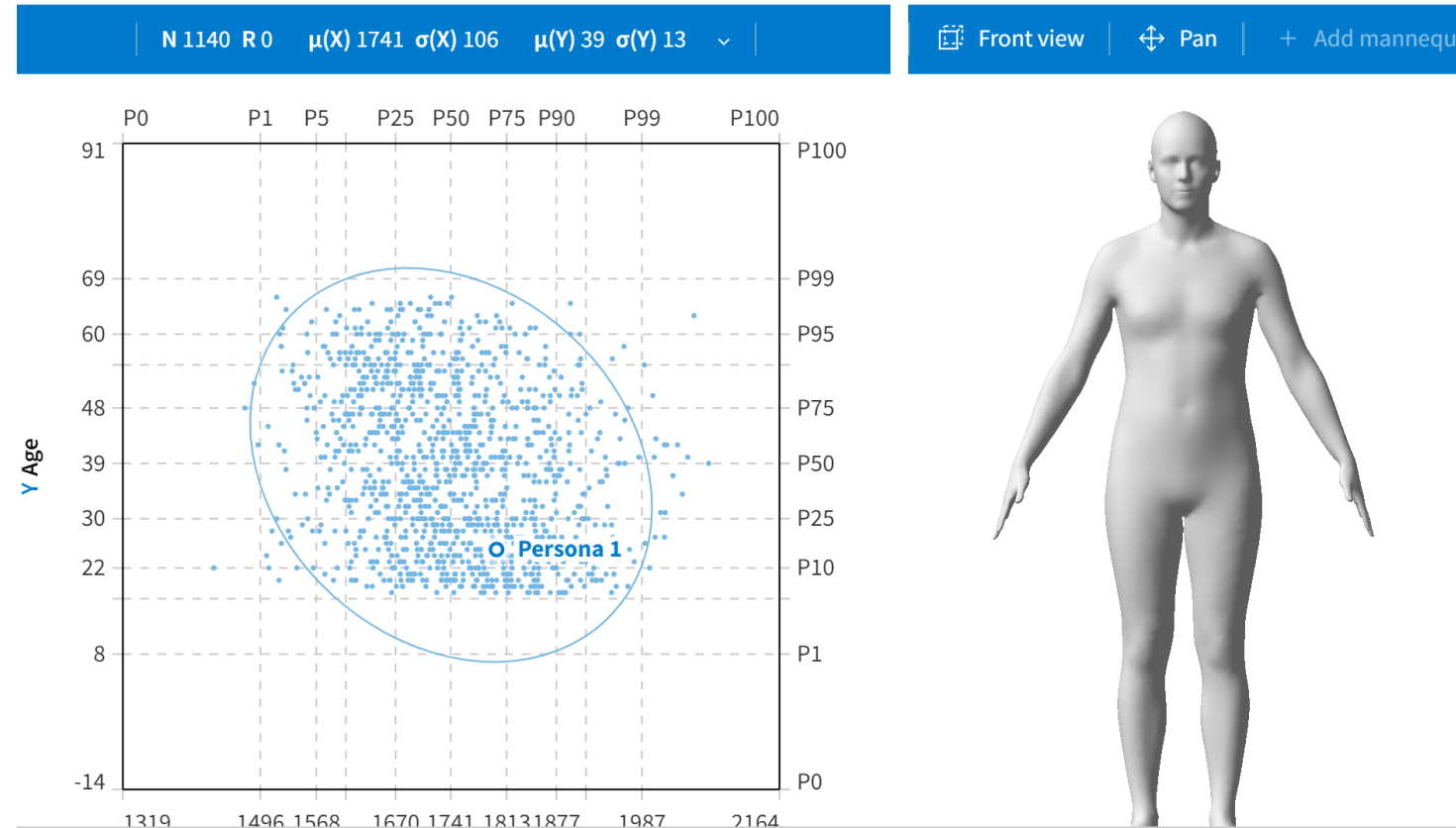
Introduction Tool Help

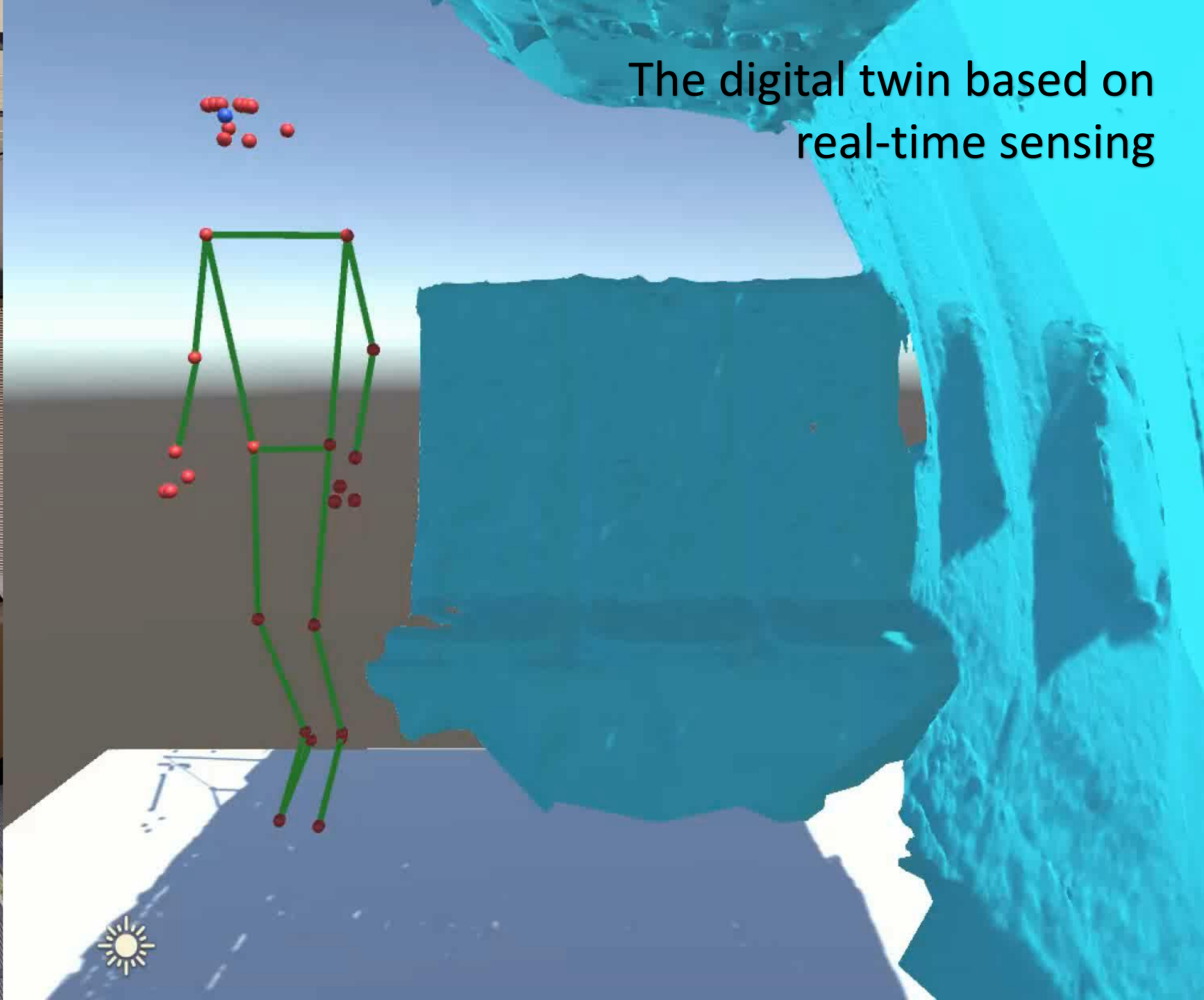
Untitled analysis | CAESAR (NL) f+m 18-66 | % Show statistics | Download

Measure Persona 1 +

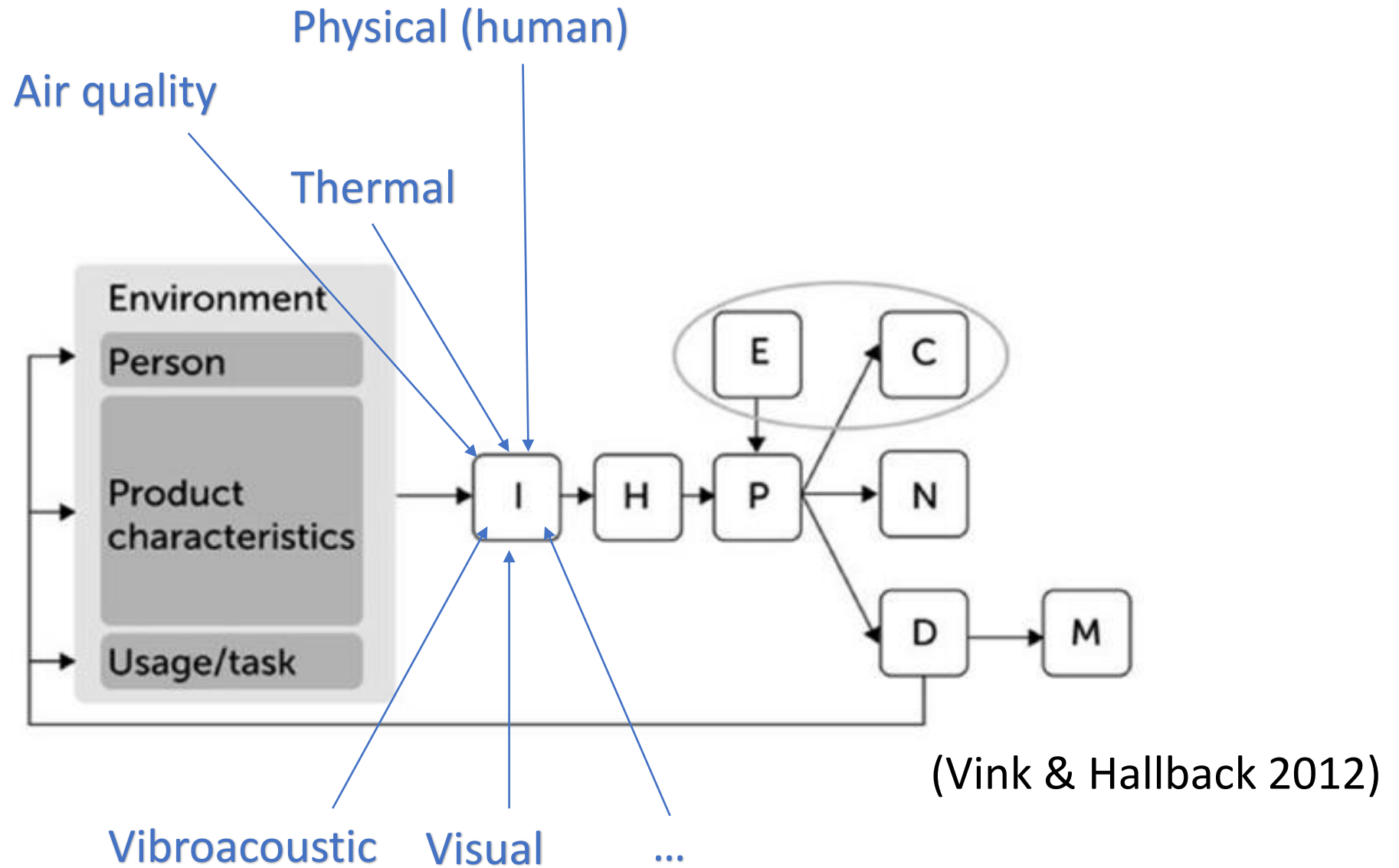
X	Stature	<input type="text" value="2"/>	1800 mm
Y	Age	<input type="text" value="80"/>	25 years

Add measure +

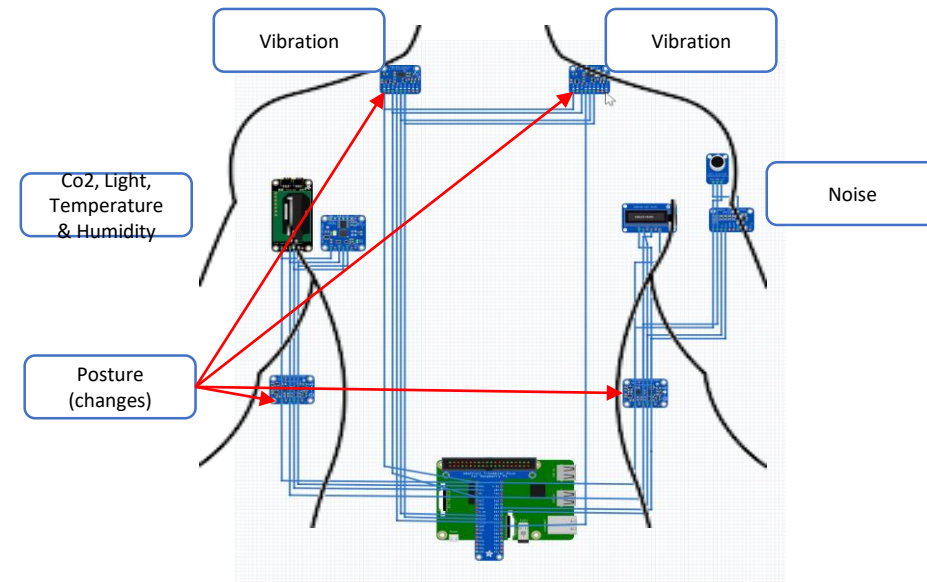




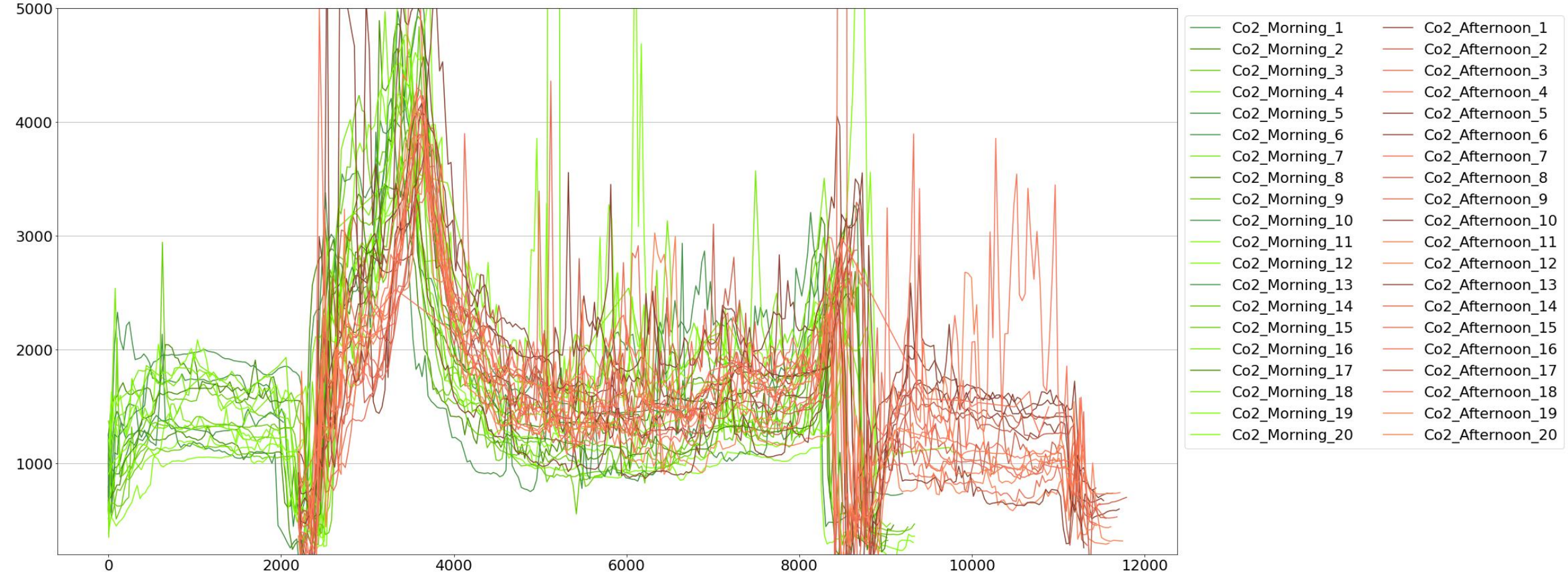
Comfort model -> Factors



Construct the model - An integrated measurement tool



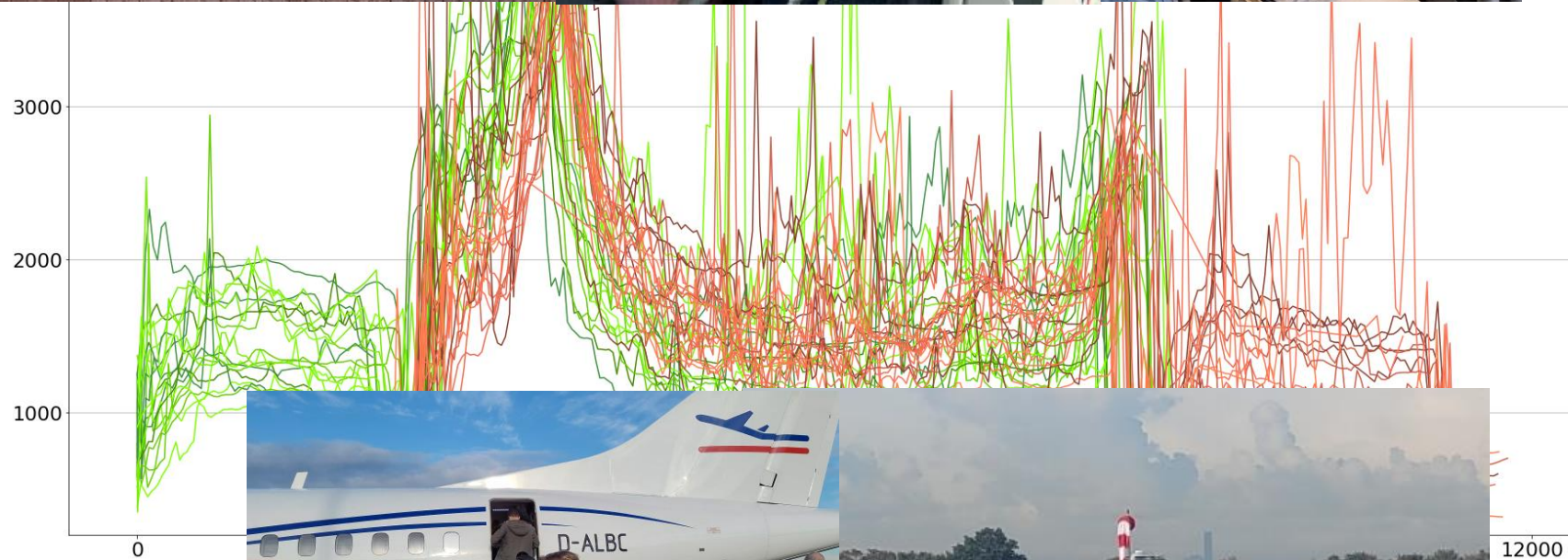
Data example -- CO2



Data example -- CO2



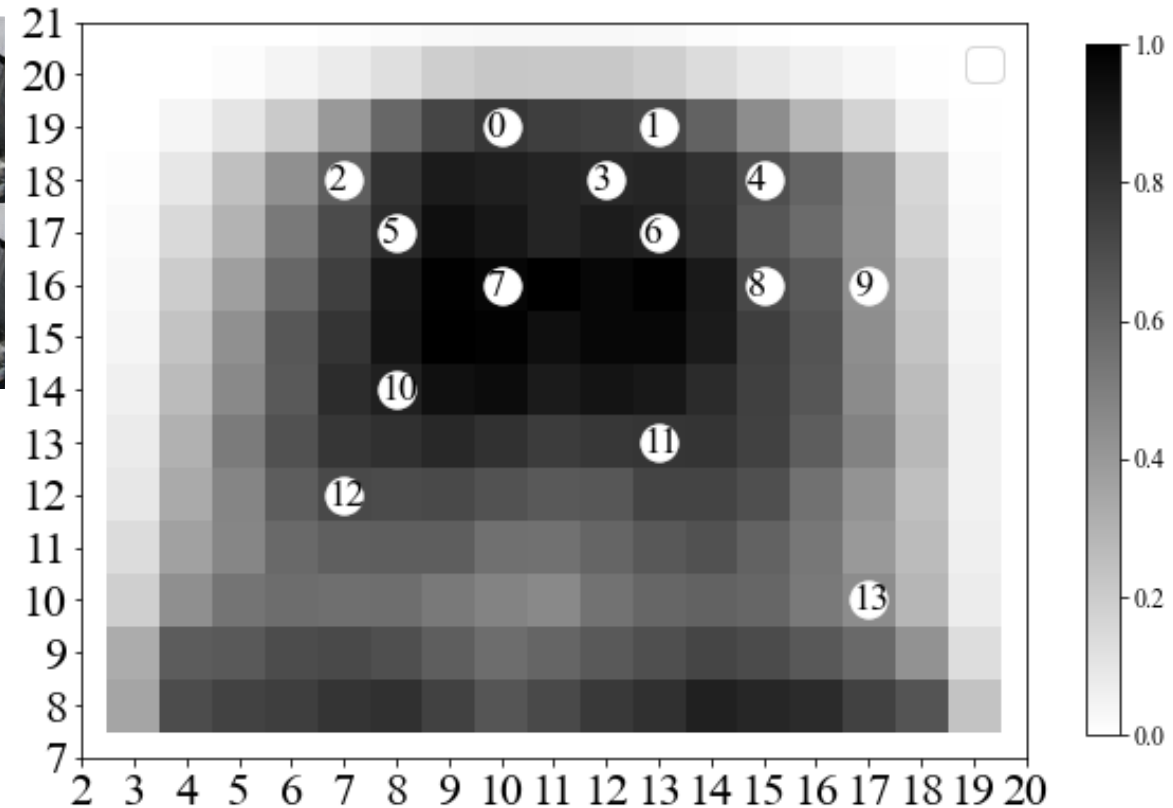
- Co2_Morning_1
- Co2_Morning_2
- Co2_Morning_3
- Co2_Morning_4
- Co2_Morning_5
- Co2_Morning_6
- Co2_Morning_7
- Co2_Morning_8
- Co2_Morning_9
- Co2_Morning_10
- Co2_Morning_11
- Co2_Morning_12
- Co2_Morning_13
- Co2_Morning_14
- Co2_Morning_15
- Co2_Morning_16
- Co2_Morning_17
- Co2_Morning_18
- Co2_Morning_19
- Co2_Morning_20
- Co2_Afternoon_1
- Co2_Afternoon_2
- Co2_Afternoon_3
- Co2_Afternoon_4
- Co2_Afternoon_5
- Co2_Afternoon_6
- Co2_Afternoon_7
- Co2_Afternoon_8
- Co2_Afternoon_9
- Co2_Afternoon_10
- Co2_Afternoon_11
- Co2_Afternoon_12
- Co2_Afternoon_13
- Co2_Afternoon_14
- Co2_Afternoon_15
- Co2_Afternoon_16
- Co2_Afternoon_17
- Co2_Afternoon_18
- Co2_Afternoon_19
- Co2_Afternoon_20



Real-time minimum viable sensing in the flight



14 sensors for recognizing 12 postures



Digital twin: Improve situation awareness of the service providers

Economy

Aircraft: 77

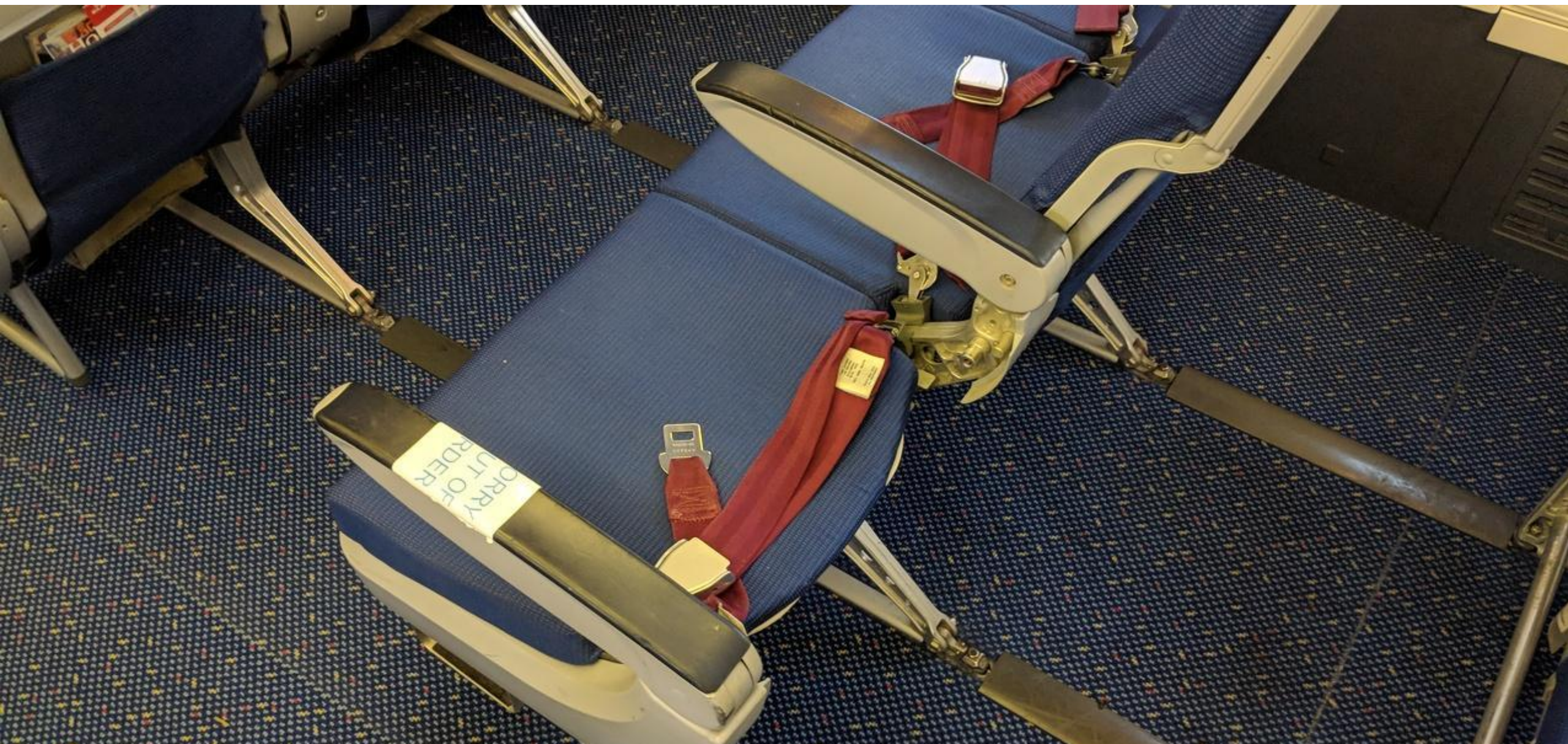
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18	■	■	■	■	■		■	■	■	■
19				■	■		■			
20	✕	✕	✕	■	■	■	■	■	■	■
21	■	■	■	✕	✕	✕	✕	■	■	■
22	■	■	■	■	■	■	■	■	■	■
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30	✕	✕		■	■	■	■	■	■	■
31	■	■						■	■	■
32	■	■						■	■	■
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42	■	■	■	■	■	■	■	■	■	■
43	■	■	■	■	■	■	■	■	■	■



Digital twin: Predictive inflight services with reduced stress



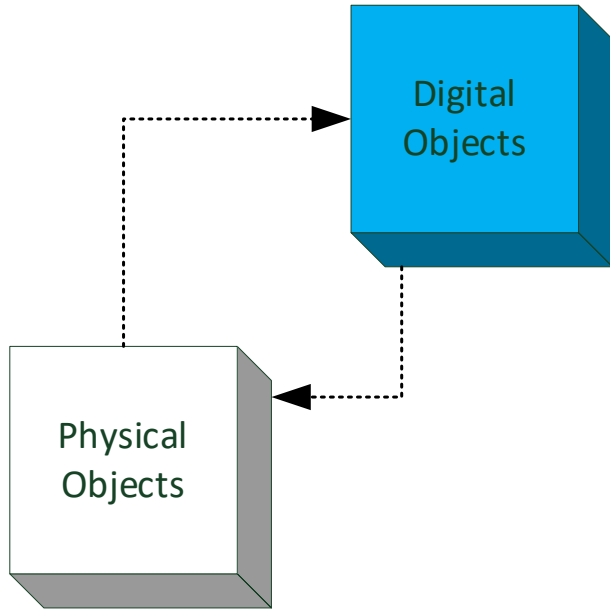
Digital twin: Predictive maintenance of the cabin



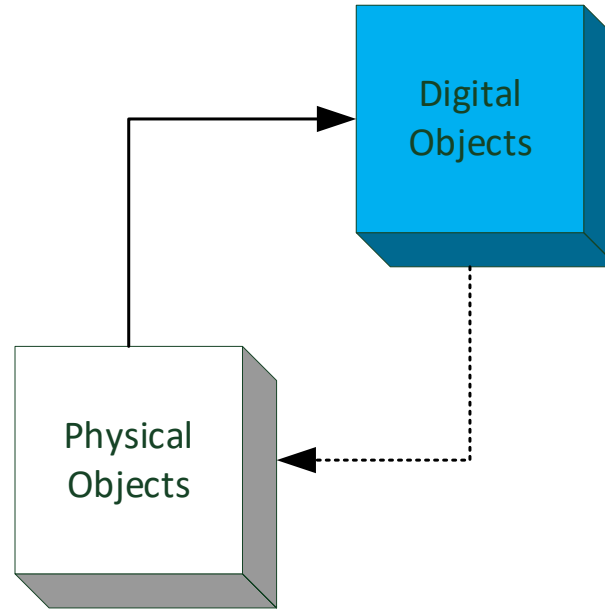
A better flight is based on a better understanding of human, maybe in real-time

Digital twin

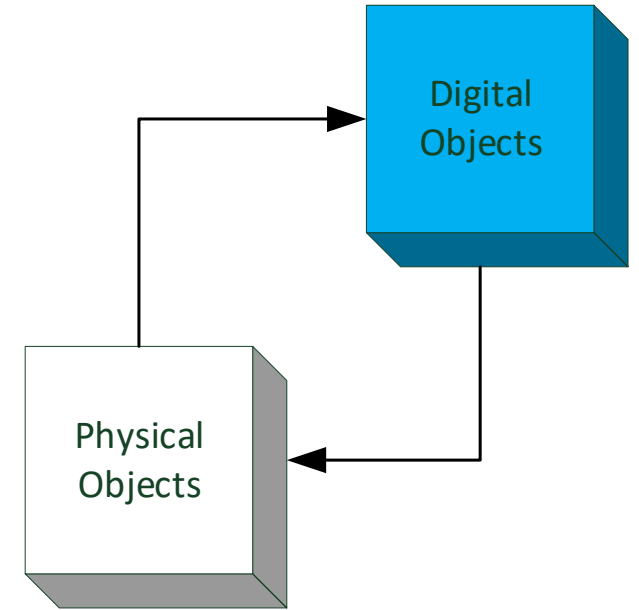
Digital Model



Digital Shadow



Digital Twin



-----Manual dataflow----->

-----Automatic dataflow----->