

# DATA SCIENCE IN ACTION

and how entrepreneurship can help you achieve innovation in health

ELISABETH HUIS IN 'T VELD, PHD, MBA

*AiMR*



# INTRODUCTION



dr. Elisabeth Huis in 't Veld, MBA

**Bsc** Health Psychology  
**MSc** Research Master Medical/Clinical Psychology  
**PhD** Cognitive & Affective Neuroscience  
**MBA** Executive MBA from TIAS Business School.

**Assistant professor**

Cognitive Science & Artificial Intelligence  
Tilburg University

**Principal investigator Donor Cognition**

Donor Medicine Research  
Sanquin bloodbank, Amsterdam

**Chief Science Officer**

AINAR BV (start-up)

**AINAR?**

An **AI driven** serious game  
that can help people to  
prevent or **conquer needle fear and fainting**

A person is holding a smartphone in their hands. The phone's screen displays a game interface. At the top, there is a bright sun or light source. Below it, a DNA double helix structure is visible, winding across the screen. The background of the game appears to be a landscape with some greenery. The person holding the phone is wearing light blue jeans. The background is slightly blurred, showing what appears to be a person's head and shoulder.

AiMe

**AINAR  
LAAT  
JOU IN  
CONTROL.**

EEN PRIK VERWIJDERD  
VAN ONTLADING



## TODAY'S LECTURE

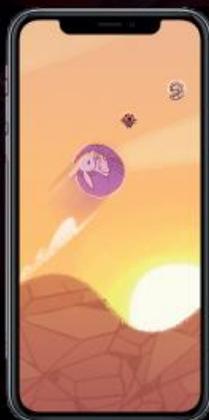
My journey from **science** to **start-up**

And how simple **lean start-up tools**  
and my **mistakes**  
can make you a better **data scientist**

AiMe

**AINAR  
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CONTROL.**

EEN PRIK VERWIJDERD  
VAN ONTLADING



## WHY?

A major **pitfall** of data scientists (I know, not all)

Developing cool solutions and **code**

Without checking if your **data fits the goal**

Or whether anyone is at all interested....

**WHERE IT STARTED...**

2016: SANQUIN



2017: TIAS BUSINESS SCHOOL



## WHERE I LEARNED...

People faint...



- How to design **solutions** in a 'lean' way
- How thinking about the **business case** helps to define your research

LEAN CANVAS					COMPANY	DATE	VERSION
<b>PROBLEM</b> - List your top 1-3 problems	<b>SOLUTION</b> - Outline a possible solution for each problem	<b>UNIQUE VALUE PROPOSITION</b> - Single, clear, compelling message that states why you are different and worth paying attention	<b>UNFAIR ADVANTAGE</b> - Something that cannot easily be bought or copied	<b>CUSTOMER SEGMENTS</b> - List your target customers and users			
<b>EXISTING ALTERNATIVES</b> - List how these problems are solved today	<b>KEY METRICS</b> - List the key numbers that tell you how your business is doing		<b>CHANNELS</b> - List your path to customers (inbound or outbound)		<b>EARLY ADOPTERS</b> - List the characteristics of your ideal customers		
<b>COST STRUCTURE</b> - List your fixed and variable costs	<b>REVENUE STREAMS</b> - List your sources of revenue						

## THE PROBLEM

- Donors who experience fear or stress are more likely to suffer from vasovagal reactions
- However, they are terrible at reporting it on time
- By the time you can see it in their face, or they tell you, it's too late....

So how do you get people to give you money for research and solution development?



# STEP 1: FOCUS

Is your problem...

... actually a problem?

... and for whom?

# IQONIC

## ARE YOU READY TO FURTHER DEVELOP YOUR IDEA?

Take the next steps to work on your idea in more depth and detail. Make use of the relevant information and the useful video's!

<https://www.tilburguniversity.edu/campus/entrepreneurship>

### FOCUS

WHAT? FOR WHO?

Must see

- ▶ Lean startup
- ▶ Lean canvas

Should do

Fill in a Lean canvas

- ▶ Lean canvas

### DERISK

CHECK YOUR ASSUMPTIONS & TALK TO POTENTIAL CUSTOMERS

Must see

- ▶ Experiment Board
- ▶ Riskiest Assumptions
- ▶ Customer Interviews
- ▶ Early Adopters

Should do

Fill in an Experiment Board and interview at least 10 Potential users of your idea

- ▶ Experiment Board

### BUILD

TEST YOUR SOLUTION WITH POTENTIAL CUSTOMERS

Must see

- ▶ Pivot
- ▶ Measure
- ▶ MVP

Should do

Make an MVP and test your solution.

MY STARTUP, \_\_\_\_\_

IS WORKING ON \_\_\_\_\_

TO HELP \_\_\_\_\_

TO SOLVE \_\_\_\_\_

BY \_\_\_\_\_

### PITCH

PITCH YOUR IDEA WITHIN 1 MINUTE

Must see

- ▶ Pitch

Should do

Complete your madlib.

### READY?

Register for an expert-hour  
With a business developer to  
Receive more coaching & feedback.

# IQONIC

Business where society benefits

# DEFINING THE PROBLEM

- What is/are the **problem(s)**?
- **Who** is experiencing the problem(s)?
- Who are the **stakeholders**?
  - End-users (e.g. patients)
  - Users (e.g. doctors)
  - Non-user decision makers? (e.g. company, hospital)

## LEAN CANVAS

COMPANY ???
DATE 2017
VERSION 1

<p><b>PROBLEM</b></p> <p><small>- List your top 1-3 problems</small></p> <p>- Fear and fainting are very unpleasant - Due to <u>seeing needles/blood</u></p> <p><u>Sanguin:</u> - Top barriers recruitment - 16% of donors is scared - &gt; 7000 donors suffer VVR and do not return</p> <p><b>EXISTING ALTERNATIVES</b></p> <p><small>- List how these problems are solved today</small></p>	<p><b>SOLUTION</b></p> <p><small>- Outline a possible solution for each problem</small></p>	<p><b>UNIQUE VALUE PROPOSITION</b></p> <p><small>- Single, clear, compelling message that states why you are different and worth paying attention</small></p>	<p><b>UNFAIR ADVANTAGE</b></p> <p><small>- Something that cannot easily be bought or copied</small></p>
<p><b>KEY METRICS</b></p> <p><small>- List the key numbers that tell you how your business is doing</small></p>	<p><b>HIGH-LEVEL CONCEPT</b></p> <p><small>- List your X for Y analogy e.g. Youtube = Flickr for videos</small></p>	<p><b>CHANNELS</b></p> <p><small>- List your path to customers (inbound or outbound)</small></p>	<p><b>CUSTOMER SEGMENTS</b></p> <p><small>- List your target customers and users</small></p> <p>- People with needle fear - Blood banks</p> <p><b>EARLY ADOPTERS</b></p> <p><small>- List the characteristics of your ideal customers</small></p>
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AKA:  
stakeholders?

TILBURG UNIVERSITY

Get ready for the next step. [Tilburguniversity.edu/iqonic](http://Tilburguniversity.edu/iqonic)

# DEFINING A SOLUTION

- What are potential **solutions** to the problem
- Link** possible problem(s) to solutions
- What are the **alternatives**?
- What makes the solution(s) **unique**?
- What is the **value** of your solution(s)?

## LEAN CANVAS

COMPANY ???
DATE 2017
VERSION 1

<p><b>PROBLEM</b></p> <p><small>- List your top 1-3 problems</small></p> <ul style="list-style-type: none"> <li>- Fear and fainting are very unpleasant</li> <li>- Due to <u>seeing needles/blood</u></li> </ul> <p><u>Sanguin:</u></p> <ul style="list-style-type: none"> <li>- Top barriers recruitment</li> <li>- 16% of donors is scared</li> <li>- &gt; 7000 donors suffer VVR and do not return</li> </ul> <p><b>EXISTING ALTERNATIVES</b></p> <p><small>- List how these problems are solved today</small></p> <ul style="list-style-type: none"> <li>- Doing nothing</li> <li>- Drinking water / eating</li> <li>- Muscle tension techniques</li> </ul>	<p><b>SOLUTION</b></p> <p><small>- Outline a possible solution for each problem</small></p> <p style="text-align: center; font-size: 1.2em;">VR!</p> <p><b>KEY METRICS</b></p> <p><small>- List the key numbers that tell you how your business is doing</small></p>	<p><b>UNIQUE VALUE PROPOSITION</b></p> <p><small>- Single, clear, compelling message that states why you are different and worth paying attention</small></p> <ul style="list-style-type: none"> <li>- Addresses <u>the cause</u></li> <li>- Prevents loss of acquisition costs</li> <li>- Retaining donors is safer and cheaper (€7 vs €35).</li> </ul> <p><b>HIGH-LEVEL CONCEPT</b></p> <p><small>- List your X for Y analogy e.g. Youtube = Flickr for videos</small></p>	<p><b>UNFAIR ADVANTAGE</b></p> <p><small>- Something that cannot easily be bought or copied</small></p> <p><b>CHANNELS</b></p> <p><small>- List your path to customers (inbound or outbound)</small></p>	<p><b>CUSTOMER SEGMENTS</b></p> <p><small>- List your target customers and users</small></p> <ul style="list-style-type: none"> <li>- People with needle fear</li> <li>- Blood banks</li> </ul> <p><b>EARLY ADOPTERS</b></p> <p><small>- List the characteristics of your ideal customers</small></p>
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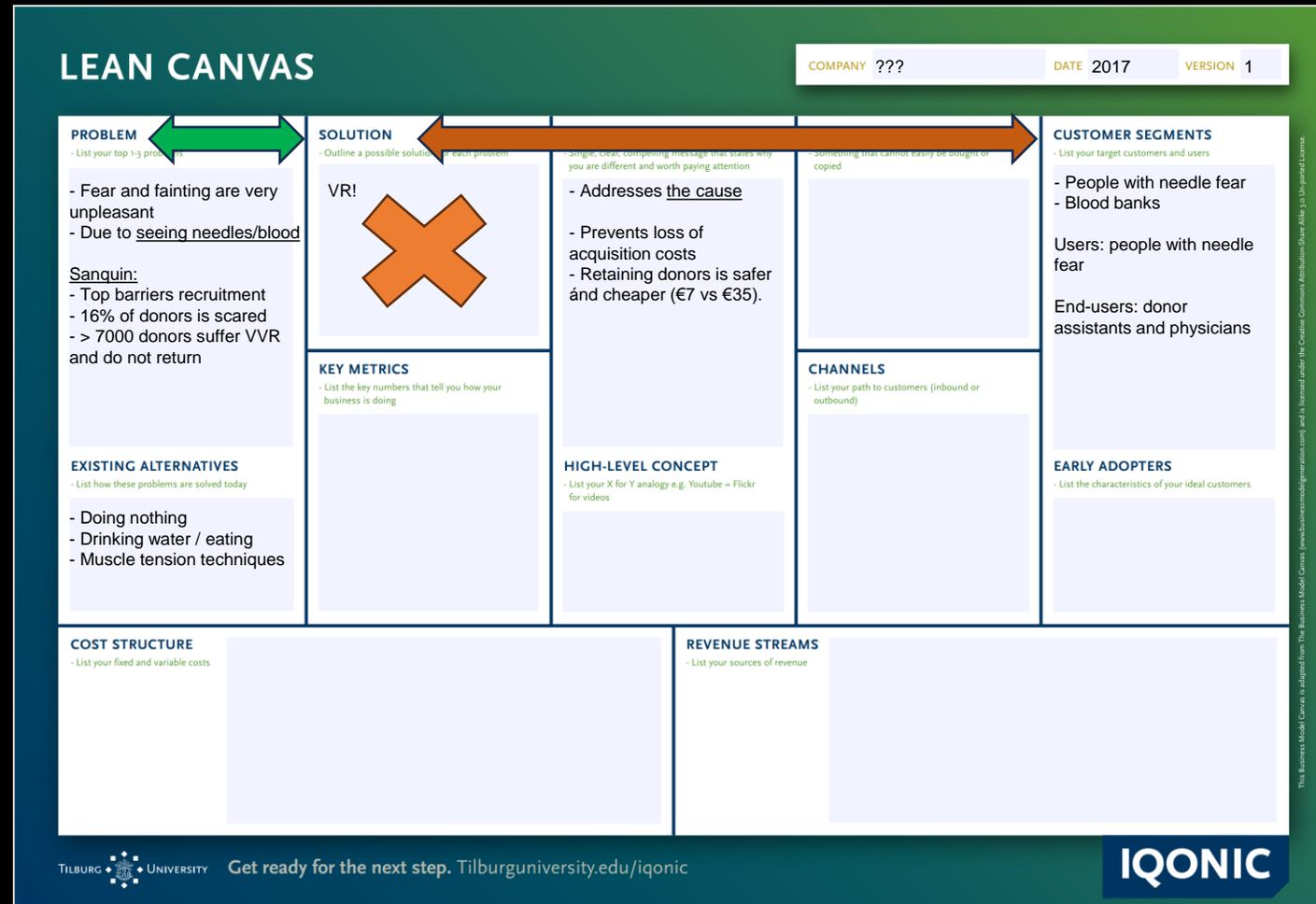
## MY MISTAKES

1. Thinking I would get money only because: needle fear = sad?
2. Pitching the **wrong** solution
3. But thinking **I was right**

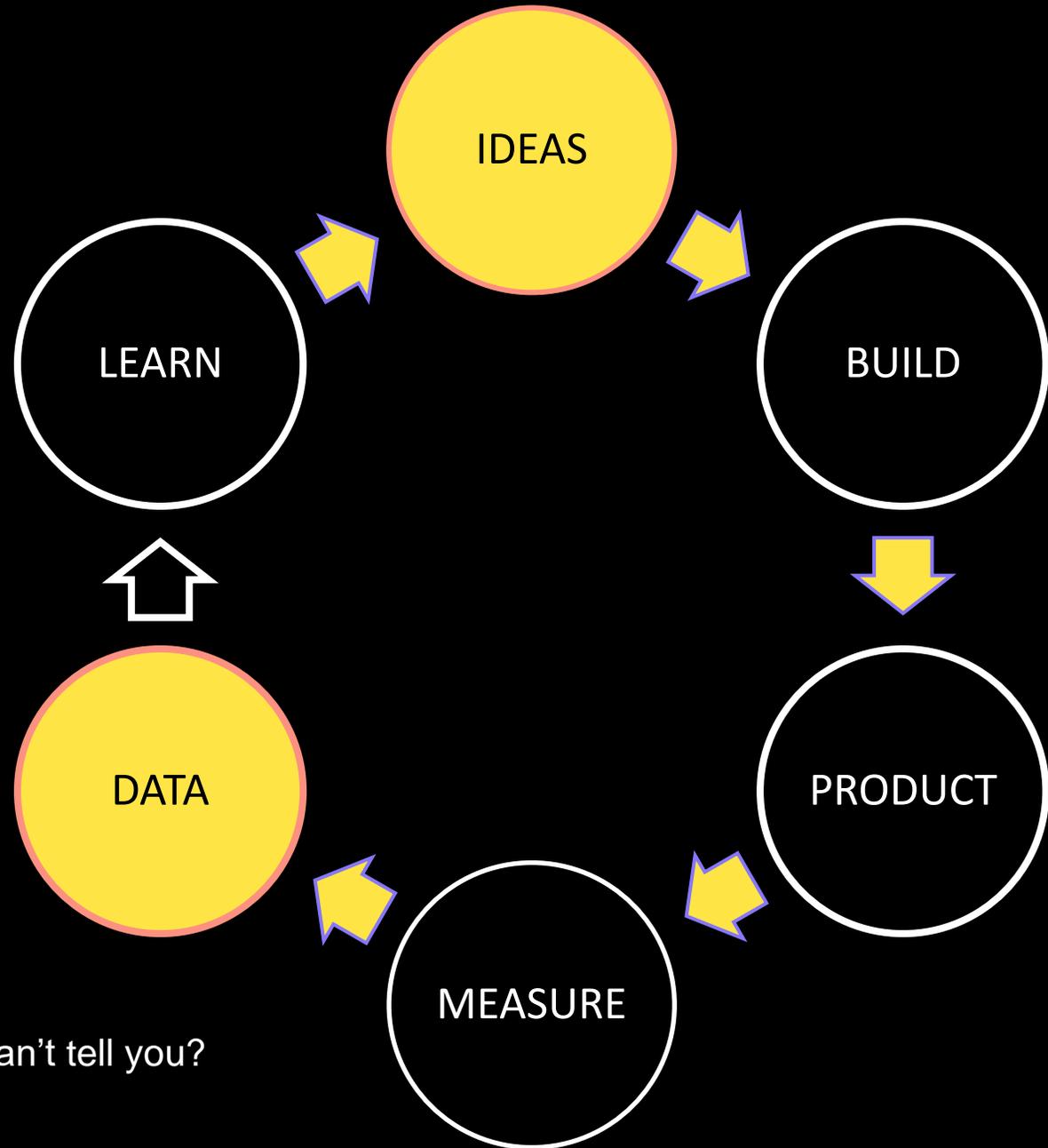
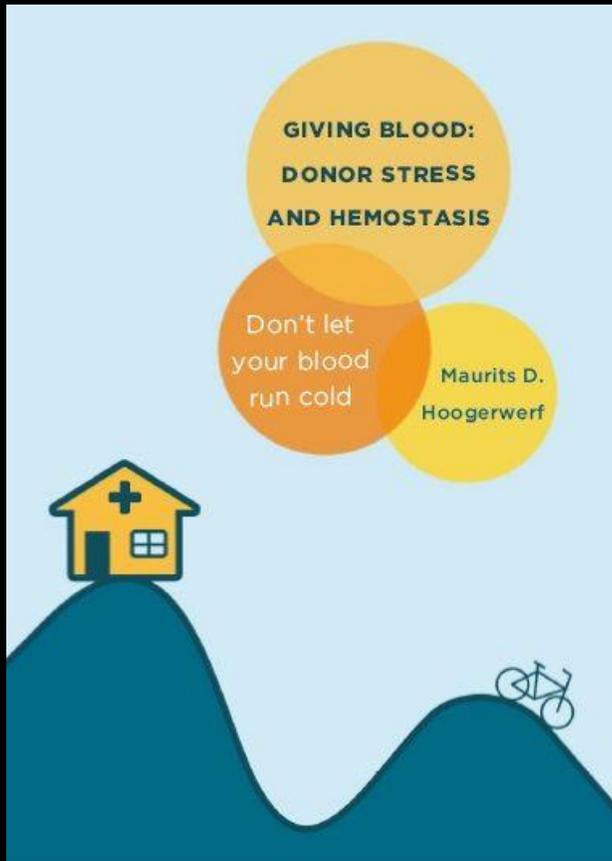


# ALIGNMENT IS KEY...

- Is your **solution** a solution to
  - the problem
  - And to your **stakeholders**?



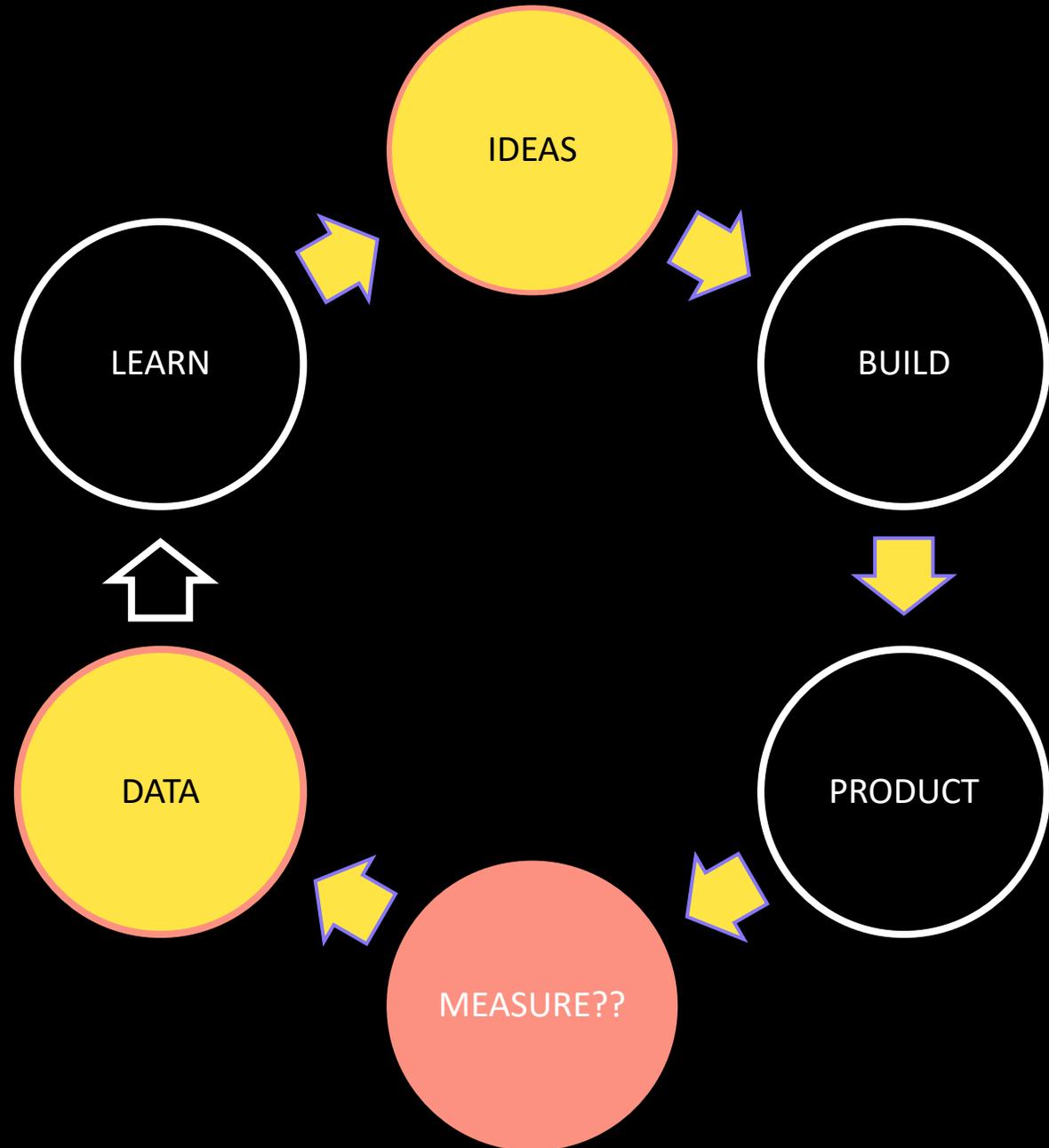




How to measure what people can't tell you?



How to measure what people can't tell you?







LATEST

MOST VIEWED

SCIENCE STATS

Half the world's annual rain falls in just 12 days

BY KYLE PLANTZ

NOVEMBER 30, 2018

NEWS IN BRIEF

Stone Age people conquered the Tibetan Plateau's thin air

BY BRUCE BOWER

NOVEMBER 30, 2018

NEWS

Around the world, reported measles cases jumped 31 percent in 2017

BY AIMEE CUNNINGHAM

NOVEMBER 30, 2018

NEWS

An acid found in soil may make a disease killing deer less infectious

BY JENNIFER LEMAN

NOVEMBER 30, 2018

NEWS

A jumping spider mom nurses her brood for weeks on milk

BY SUSAN MILIUS

NOVEMBER 29, 2018

SOCIETY UPDATE

Conversations with Maya: Mary Sue Coleman

NEWS

Astronomers have measured all the starlight ever emitted

# Gory Details

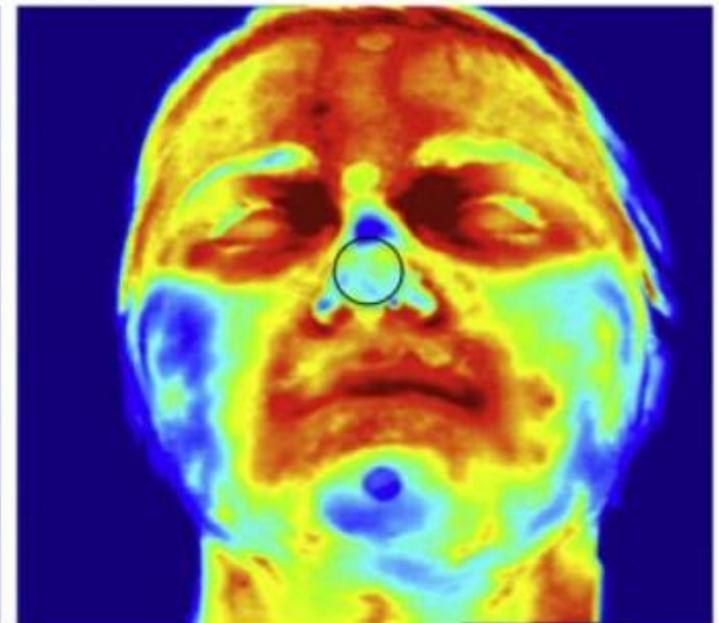
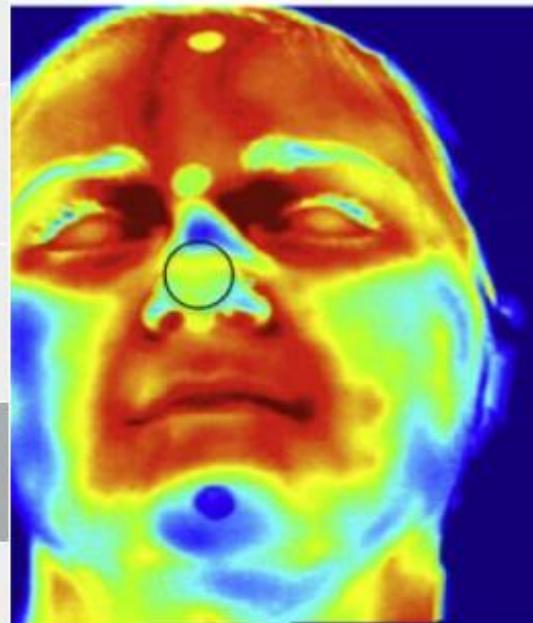
THE BIZARRE SIDE OF SCIENCE  
ERIKA ENGELHAUPT



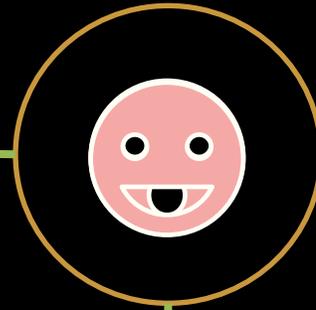
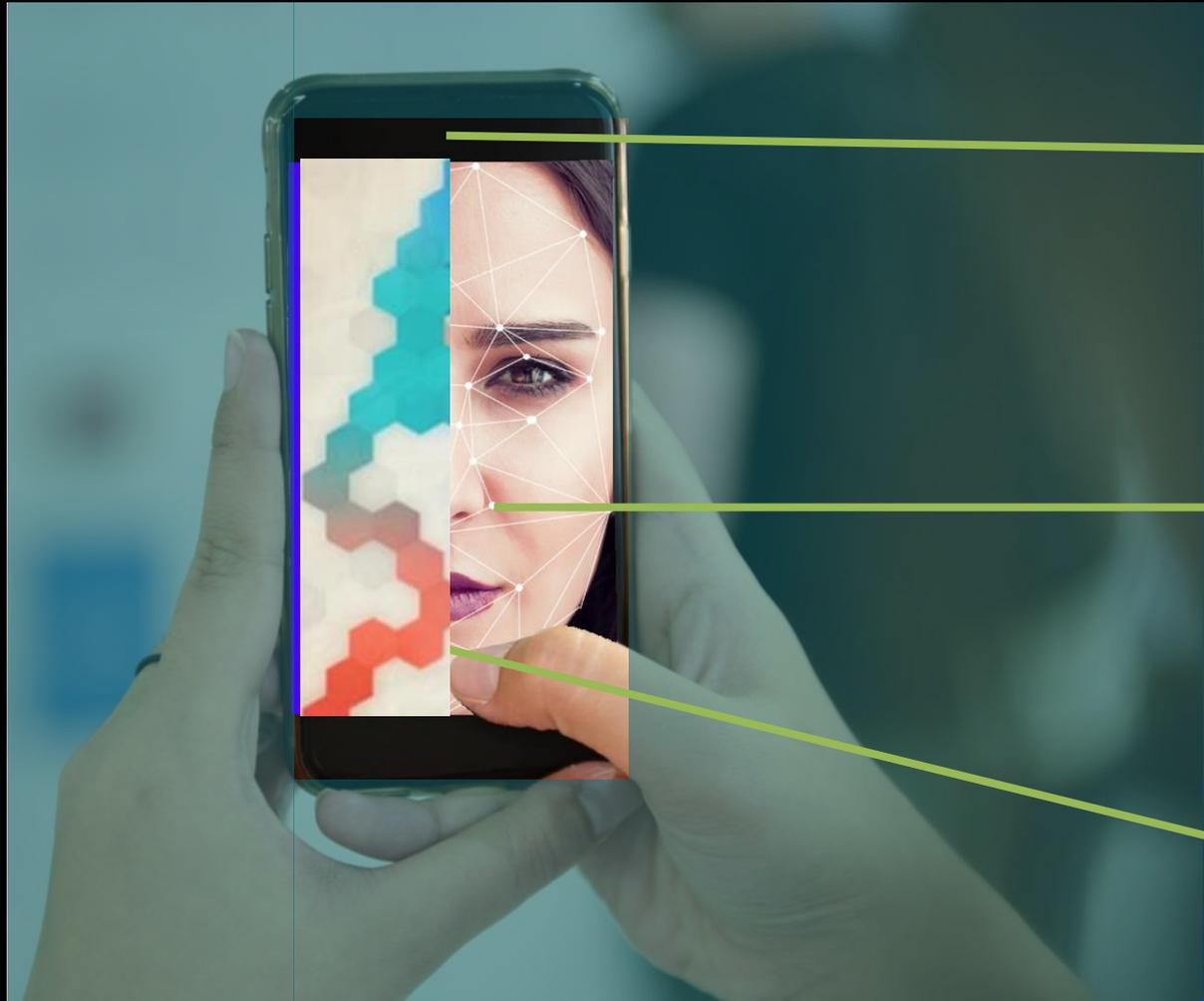
GORY DETAILS PSYCHOLOGY

## Your fear is written all over your face, in heat

BY ERIKA ENGELHAUPT 6:09PM, MARCH 26, 2014



# SOLUTION IDEA:



Camera  
monitors  
patient



AI :  
Symptoms/  
risk



Adjusts  
gameplay



# STEP 2: CHECK

Talk to people

Check your assumptions

Find your early adopters



## ARE YOU READY TO FURTHER DEVELOP YOUR IDEA?

Take the next steps to work on your idea in more depth and detail. Make use of the relevant information and the useful video's!

<https://www.tilburguniversity.edu/campus/entrepreneurship>

**1 FOCUS**  
WHAT? FOR WHO?  
Must see  
▶ Lean startup ▶ Lean canvas  
Should do  
Fill in a Lean canvas  
▶ Lean canvas

**2 DERISK**  
CHECK YOUR ASSUMPTIONS & TALK TO POTENTIAL CUSTOMERS  
Must see  
▶ Experiment Board ▶ Riskiest Assumptions  
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Should do  
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▶ Experiment Board

**3 BUILD**  
TEST YOUR SOLUTION WITH POTENTIAL CUSTOMERS  
Must see  
▶ Pivot ▶ Measure ▶ MVP  
Should do  
Make an MVP and test your solution.

**4 PITCH**  
PITCH YOUR IDEA WITHIN 1 MINUTE  
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▶ Pitch  
Should do  
Complete your madlib.

MY STARTUP, \_\_\_\_\_  
IS WORKING ON \_\_\_\_\_  
TO HELP \_\_\_\_\_  
TO SOLVE \_\_\_\_\_  
BY \_\_\_\_\_

**READY?**   
Register for an expert-hour  
With a business developer to  
Receive more coaching & feedback.



# STEP 2: CHECK

## ❖ Contact (some of) your **early adopters** (users/customer segments):

- Check if anyone has existing connections
- Talk to them and verify the problem
- Pitch your solution and verify your solution
- Invite honesty and critique and feedback

## ❖ **Channels:**

- How are you going to reach users/customers
- If your solution is implemented, what is needed in terms of customer/user contacts

## ❖ **Identify Key Metrics:**

- When is your solution a success? (test this with your users/customers!)
- What is your strategy in proving this?

**LEAN CANVAS**

COMPANY \_\_\_\_\_ DATE \_\_\_\_\_ VERSION \_\_\_\_\_

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TILBURG UNIVERSITY Get ready for the next step. [Tilburguniversity.edu/iqonic](http://Tilburguniversity.edu/iqonic) IQONIC

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## Capstone EMBA 2017 – 2019

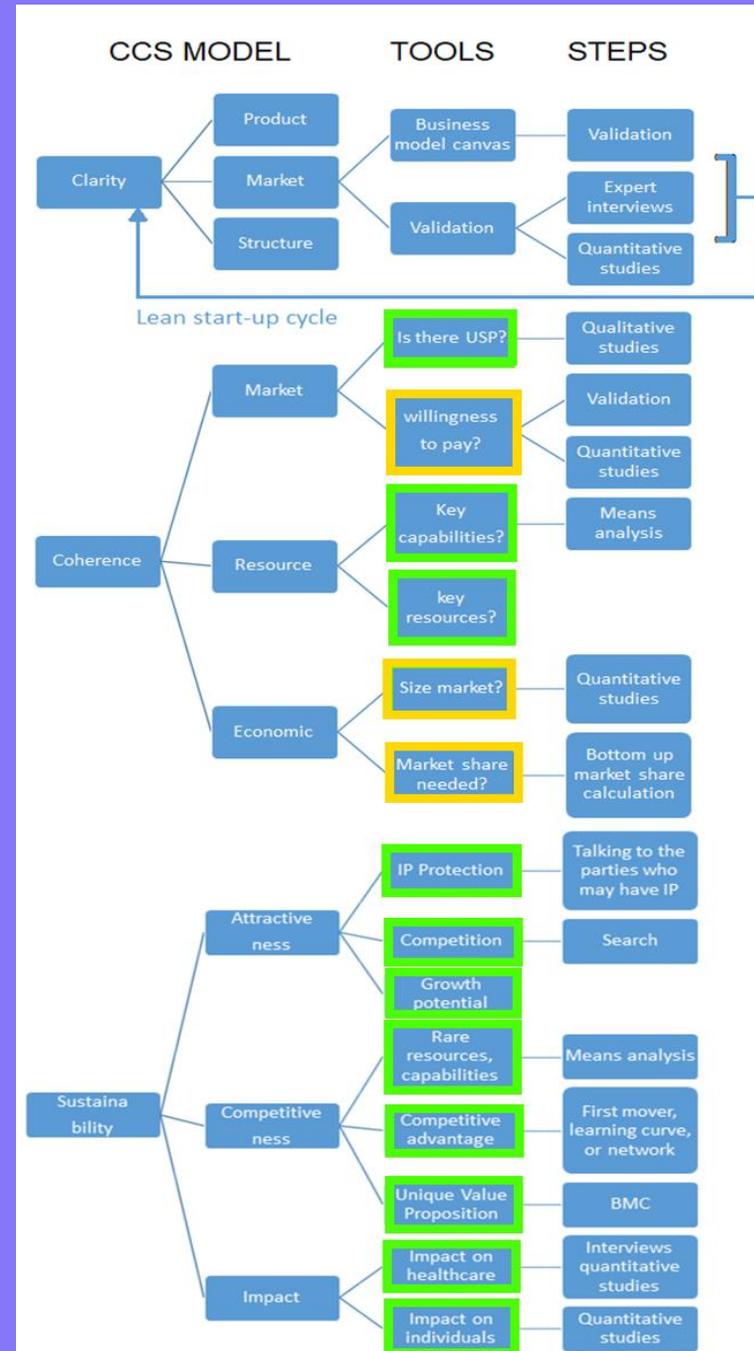
### An innovative solution for needle fear: A start-up feasibility study and business plan



Cindy van Goor

Ronnie Hahné

Elisabeth Huis in 't Veld



**>60%**

kids

**20% – 40%**

adults





## Physical reactions

- Sweating, Heart palpitations
- Nausea
- Dizziness, fainting

## Consequences:

- Avoidance of dentist (29%)
- Delay care (43%)
- Refuse treatment or vaccination (34%)
- Treatment failure (15%)

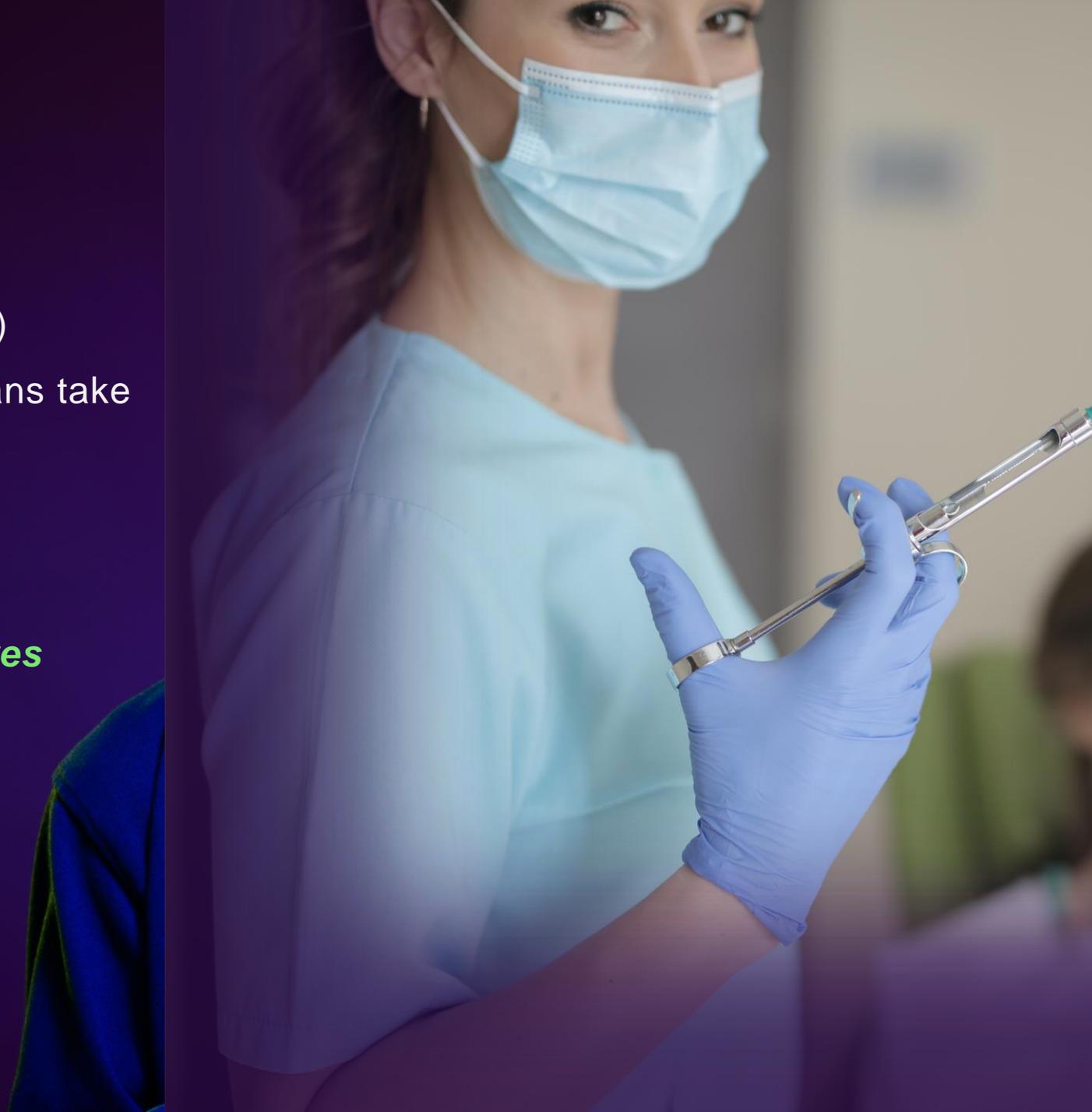
## Loss of efficiency

- Venipuncture takes **12 minutes** longer
- Or **fail** altogether (adults: 13% / kids: 21%)
- For 1 in 3, appointments and treatment plans take longer

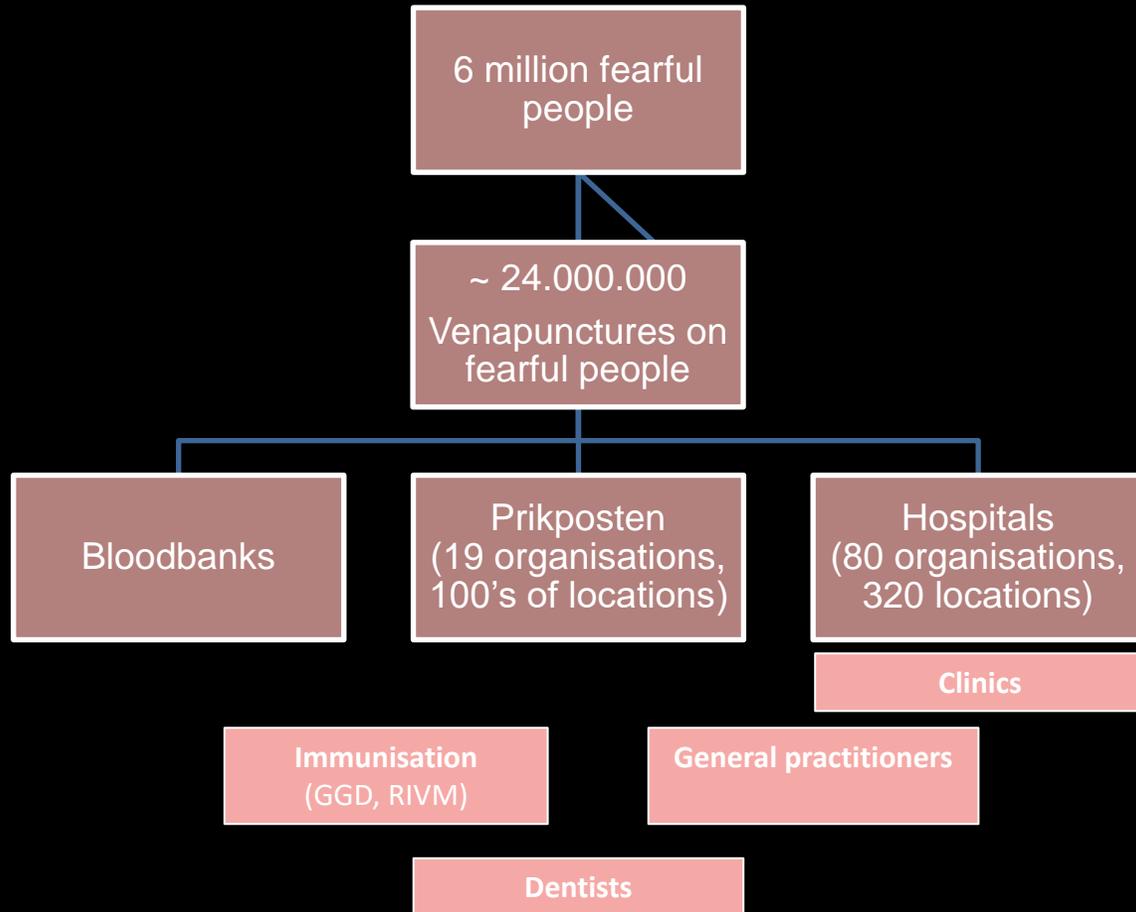
### Costs?

**> €50.000 per 100.000 venipunctures**

*AiMR*

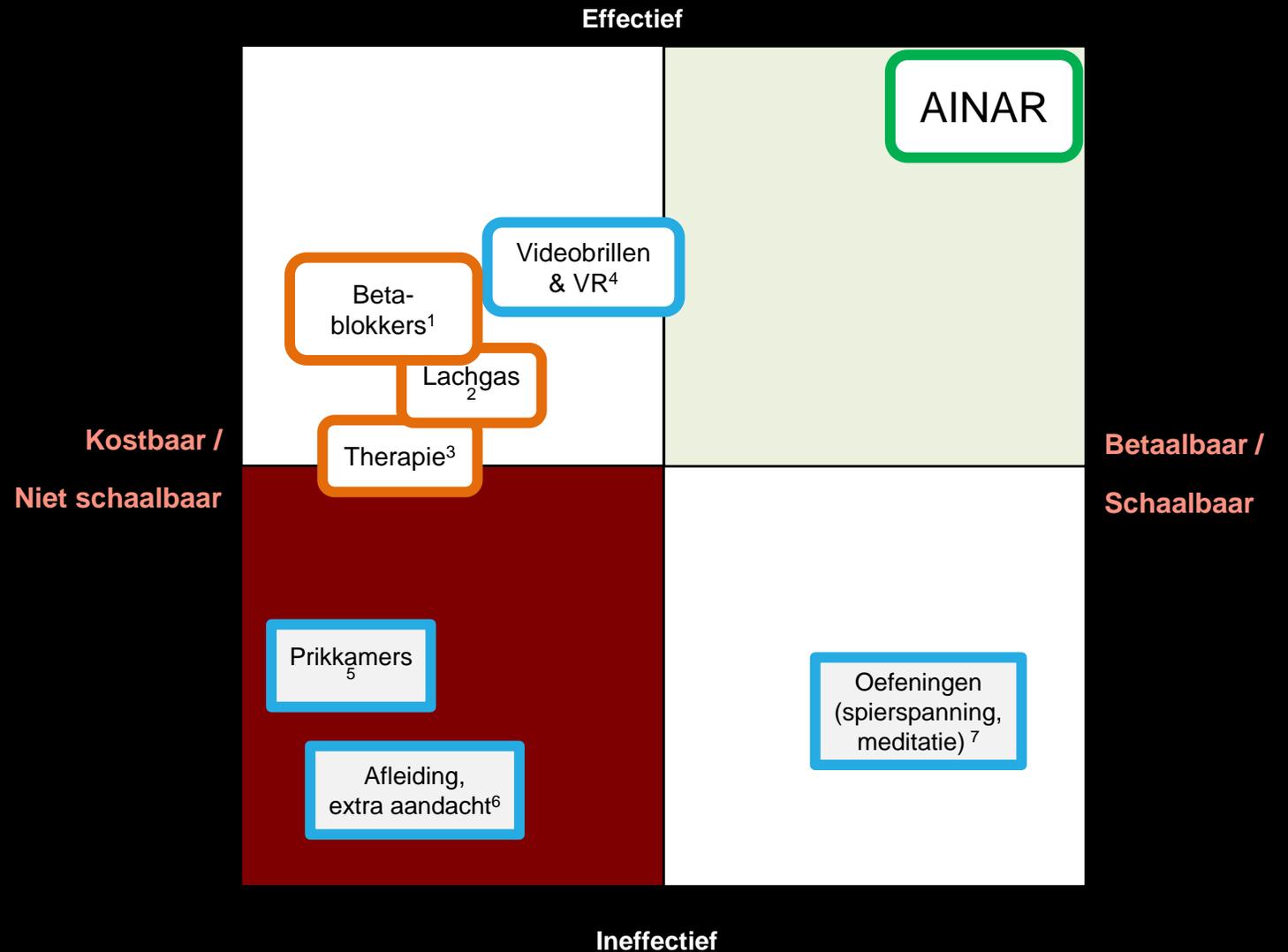


# THE MARKET?





# Alternative solutions



<p><b>Key Partners</b> </p> <p><u>Sanquin (de Dutch blood bank)</u></p> <ul style="list-style-type: none"> <li>- 330.000 donors, +200 locations</li> <li>- Well connected to hospitals</li> <li>- Marketing and communication channels</li> </ul> <p><u>Tilburg University</u></p> <ul style="list-style-type: none"> <li>- IT-infrastructure</li> <li>- Research facilities</li> <li>- In-house expertise data-science, AI.</li> <li>- Support through start-up incubator</li> </ul> <p>Potential future partners:</p> <ul style="list-style-type: none"> <li>• App/game developer for prototype and product development.</li> <li>• Existing IT solution providers to identified customer segments, to distribute our product.</li> <li>• Existing health app providers, to integrate our product as an additional service within their solution.</li> </ul>	<p><b>Key Activities</b> </p> <ol style="list-style-type: none"> <li>1. Research.</li> <li>2. (Further) develop and improve the algorithm and database.</li> <li>3. MVP/Product development (game &amp; interface)</li> <li>4. Sales.</li> <li>5. Support &amp; customer service.</li> <li>6. Marketing &amp; communication</li> <li>7. Training</li> <li>8. ICT maintenance</li> </ol>	<p><b>Value Propositions</b> </p> <p><b>“Conquer needle fear”</b> Make needle fear and VVR manageable.</p> <p><u>For blood banks</u></p> <ol style="list-style-type: none"> <li>1. Recruit new plasma donors, lower costs/need for external plasma purchases.</li> <li>2. Retain (new) donors, lowering costs/need for acquisition.</li> <li>3. Improved donor profiling, used for risk mitigation, personalised recruitment and retention strategies, etc.</li> </ol> <p><u>For ‘Prikposten’:</u></p> <ul style="list-style-type: none"> <li>• Interventions on patients with needle fear / VVR take less time (cost reduction).</li> <li>• Reduced number of medical staff required for treatment of patient with needle fear / VVR</li> <li>• Reduce risk and (potentially) dangerous incident for healthcare staff and patients.</li> </ul> <p><u>For end user with needle fear / VVR</u></p> <ul style="list-style-type: none"> <li>• Improved quality of life</li> <li>• Improved healthcare procedures and outcomes</li> </ul>	<p><b>Customer Relationships</b> </p> <ul style="list-style-type: none"> <li>• Minimise ‘burden’ on healthcare staff through support, training, service.</li> <li>• Develop API’s, through which the service can be integrated in other apps and platforms (e.g. Sanquin’s “ik geef bloed” app, creating switching costs)</li> <li>• Develop additional functionality and service, per customer requirements</li> <li>• End user engagement: build community, report on end-user’s historic data, . . . . .</li> </ul>	<p><b>Customer Segments</b> </p> <p>Customer segments for the first phase, on which the business model is based:</p> <ol style="list-style-type: none"> <li>1. Blood banks</li> <li>2. ‘Prikposten’</li> </ol> <p>These segments have the strongest financial incentive to adopt our solution (see section 2.2).</p> <p>Future customer segments:</p> <ol style="list-style-type: none"> <li>3. Foreign blood banks &amp; ‘Prikposten’</li> <li>4. Hospitals.</li> <li>5. Dentist.</li> <li>6. Fertility clinics</li> <li>7. GGD’s.</li> <li>8. Clinics for Botox, fillers, etc.</li> <li>9. Insurance companies</li> </ol> <p>Once the B2B approach has sufficiently scaled in a country, B2C might become viable.</p> <p><u>End-users can be categorised as:</u></p> <ol style="list-style-type: none"> <li>1. People who are aware of their needle fear, with intense VVR</li> <li>2. People who are aware of their needle fear, with low VVR</li> <li>3. People who are unaware of their needle fear, but who will experience VVR</li> </ol>
<p><b>Cost Structure</b> </p> <ul style="list-style-type: none"> <li>- Salaries <ul style="list-style-type: none"> <li>• R&amp;D (3 FTE covered until 2022 through research grant).</li> <li>• Sales &amp; customer relations (entrepreneurs will not require a salary from the start-up in the initial phase)</li> <li>• Service &amp; helpdesk (off-site)</li> <li>• Training and support (on-site)</li> </ul> </li> <li>- ICT-infrastructure; storage, data management (covered by Tilburg University until 2022).</li> <li>- IT distribution costs (costs for App stores, reciprocity costs to IT partner, IT providers, etc.)</li> <li>- App development and maintenance (outsourced or staff).</li> </ul>		<p><b>Revenue Streams</b> </p> <p>As the variety in the value propositions (and solutions offered) to each of the identified customer segments is wide, a viable pricing policy needs to be tested and developed further.</p> <p>In general:</p> <ul style="list-style-type: none"> <li>• Subscription fees</li> <li>• Sales revenues related to product development of custom functionality</li> <li>• Sales revenues related to product integration into existing platforms</li> </ul>		

## AIM of the FAINT study

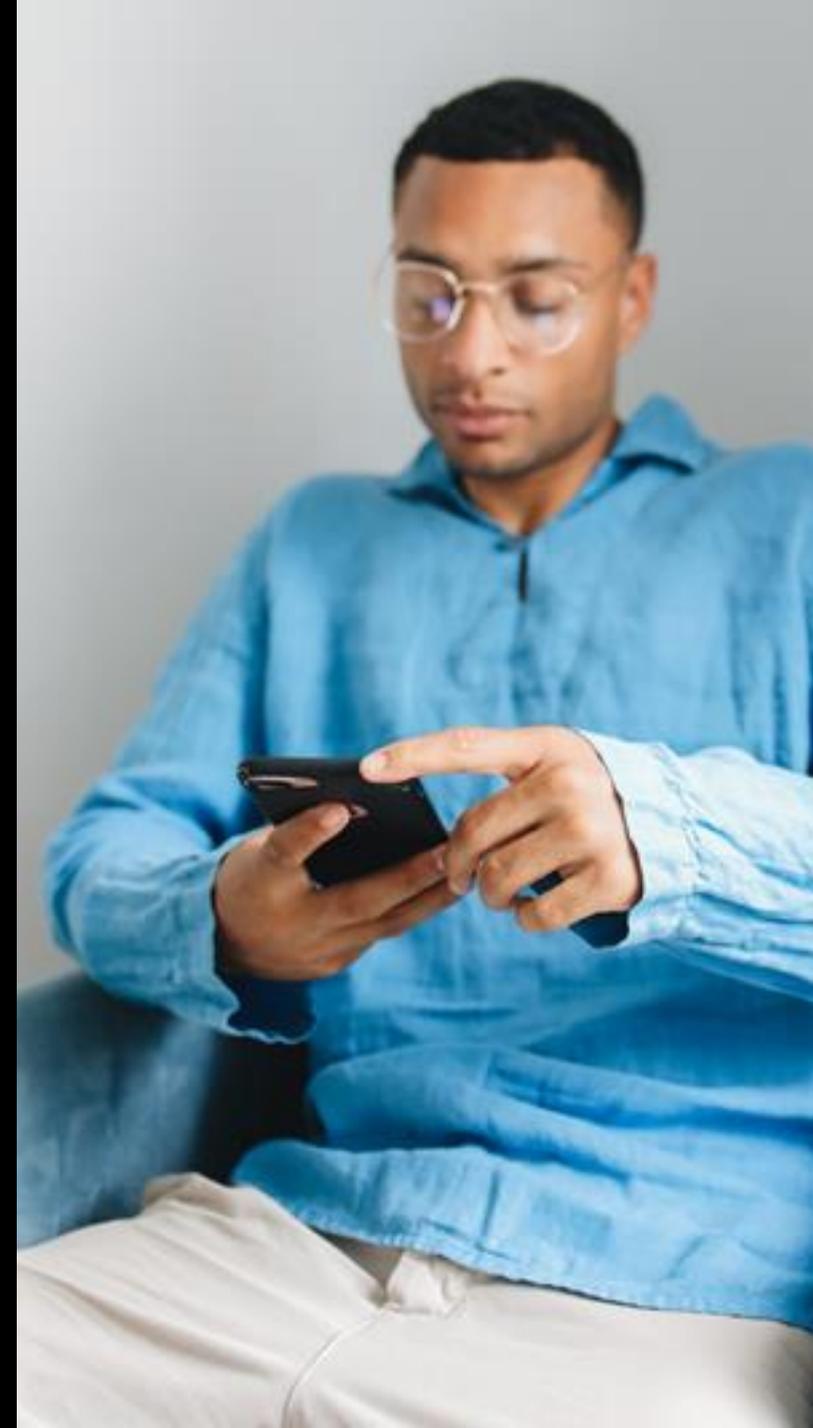
- Develop an **artificial intelligence** algoritm
- Able to **predict** fear or vasovagal reactions
- Based on **facial video data**
- Measured in **the waiting room**

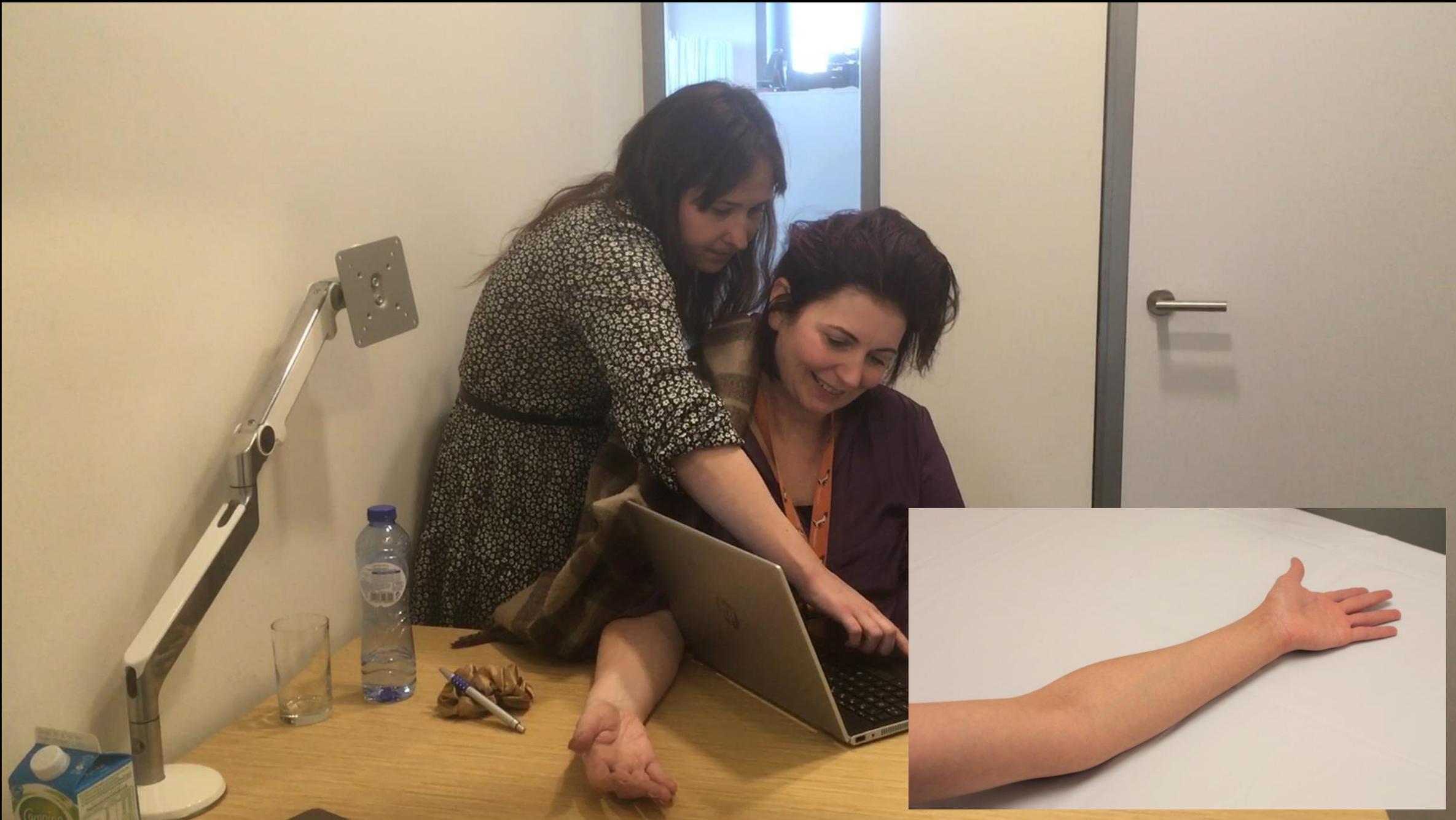
### Veni-beurs voor Lisanne Huis in't Veld: angst voor bloed en naalden

Veel mensen vallen flauw bij het zien van naalden of bloed, waardoor ze medische zorg ontwijken. Hoe kan dat? Lisanne Huis in 't Veld (TSB, Sanquin) gaat er onderzoek naar doen. Haar voorstel werd vandaag gehonoreerd door NWO.

Lisanne gaat met behulp van warmtebeeldcamera's onderzoeken hoe de hersenen en het lichaam reageren in dergelijke situaties, en een smartphone interventie ontwikkelen die gebruikt kan worden om de kans op flauwvallen te verlagen.

Onderzoeksinteresses





# The study

We followed and **filmed** donors throughout the donation procedure

With both a **regular** camera, and an **infrared thermal imaging** camera.



# (VIDEO) DATA ANALYSES

INFRARED THERMAL IMAGING  
DATA

Video data from the waiting room, prior to donation

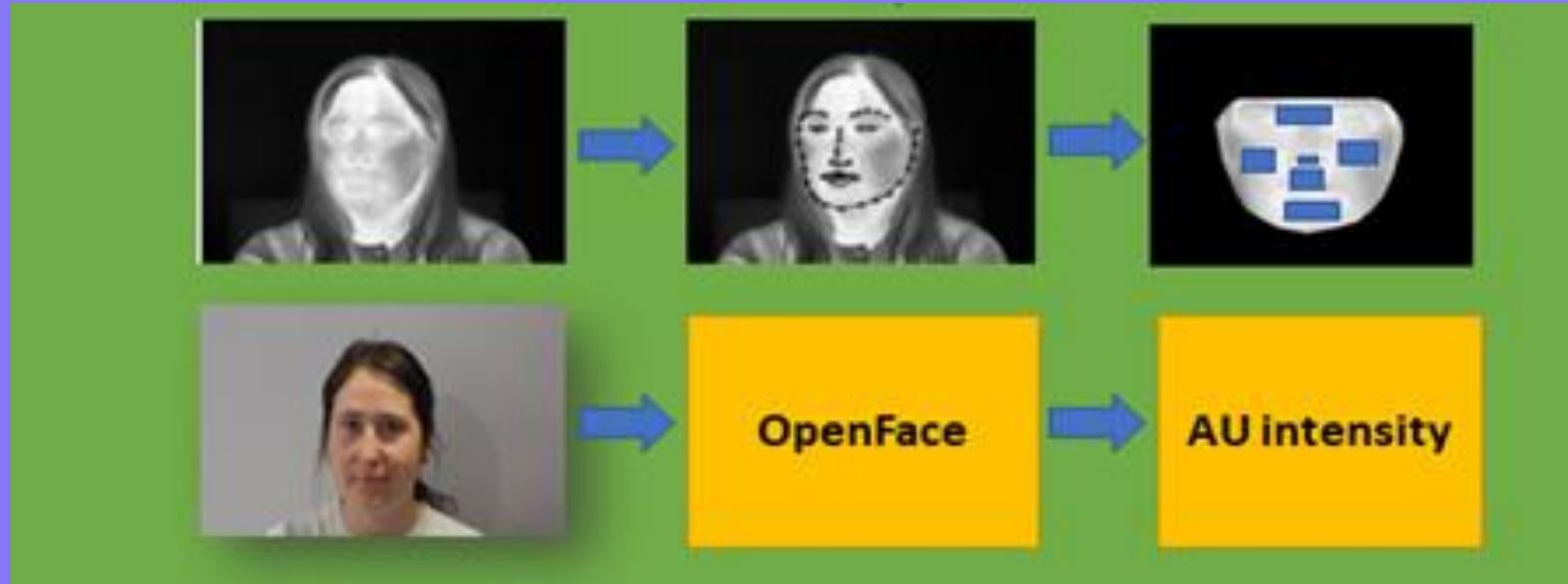


# (VIDEO) DATA ANALYSES

INFRARED THERMAL IMAGING  
DATA

EMOTIONAL EXPRESSIONS  
(MUSCLE ACTIVATIONS) |  
FROM VIDEO

Video data from the waiting room, prior to donation



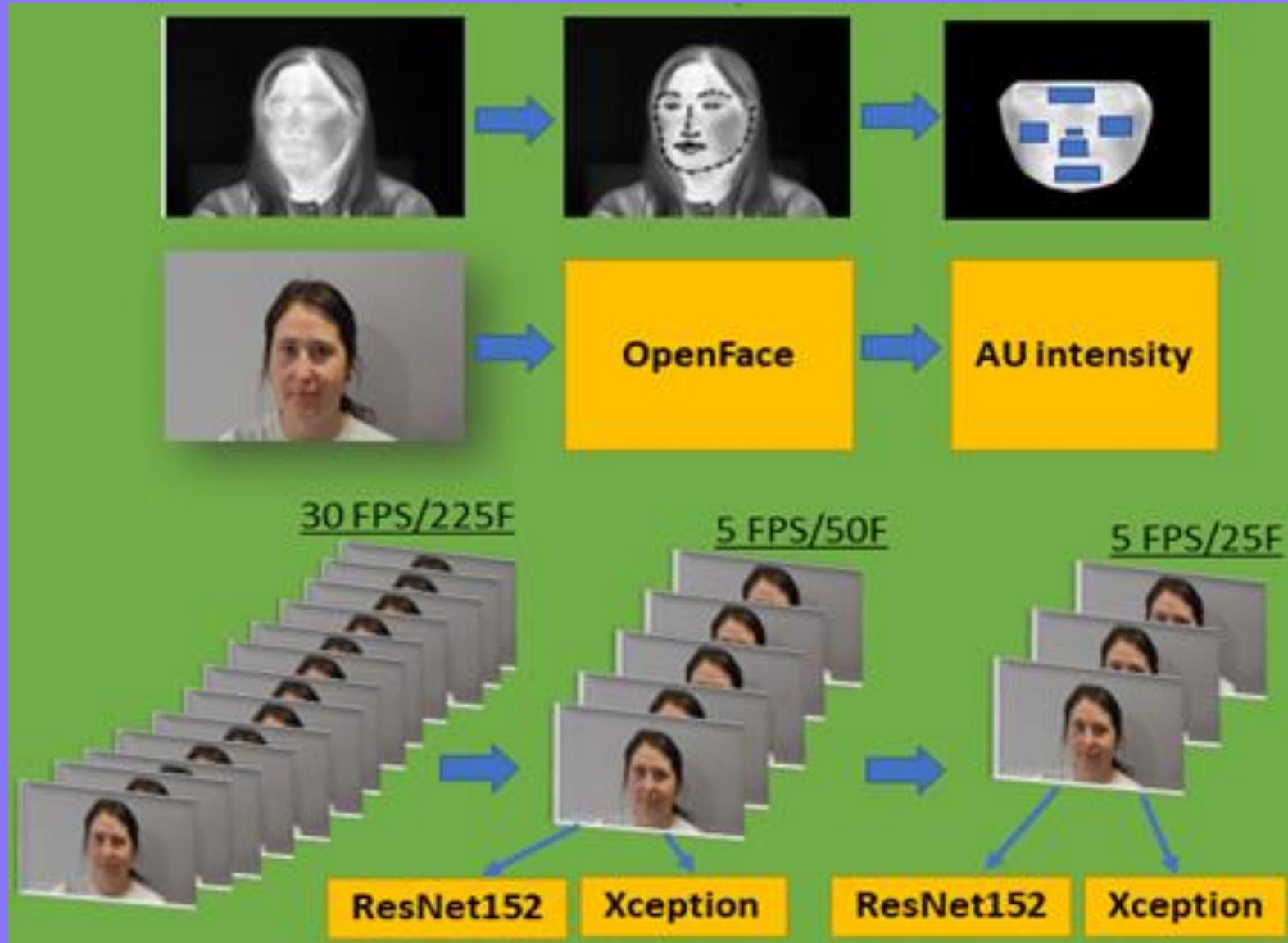
# (VIDEO) DATA ANALYSES

INFRARED THERMAL IMAGING DATA

EMOTIONAL EXPRESSIONS (MUSCLE ACTIVATIONS) | FROM VIDEO

CONTINUOUS VIDEO DATA (different framerates)

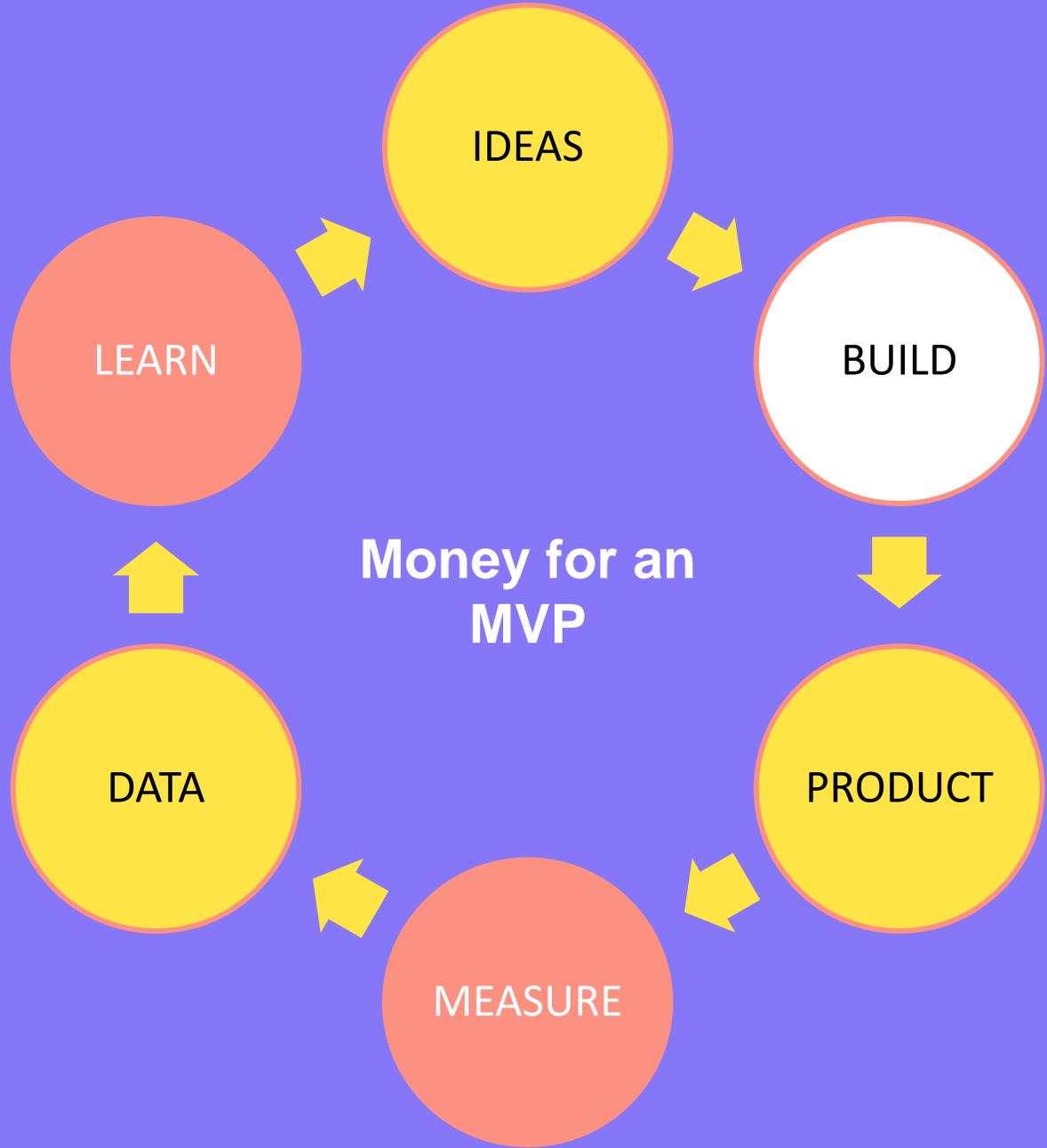
Video data from the waiting room, prior to donation



## Results: Digital video data

The best fitting model is a **2D CNN with GRU**, pretrained with ResNet152 on 25 frames

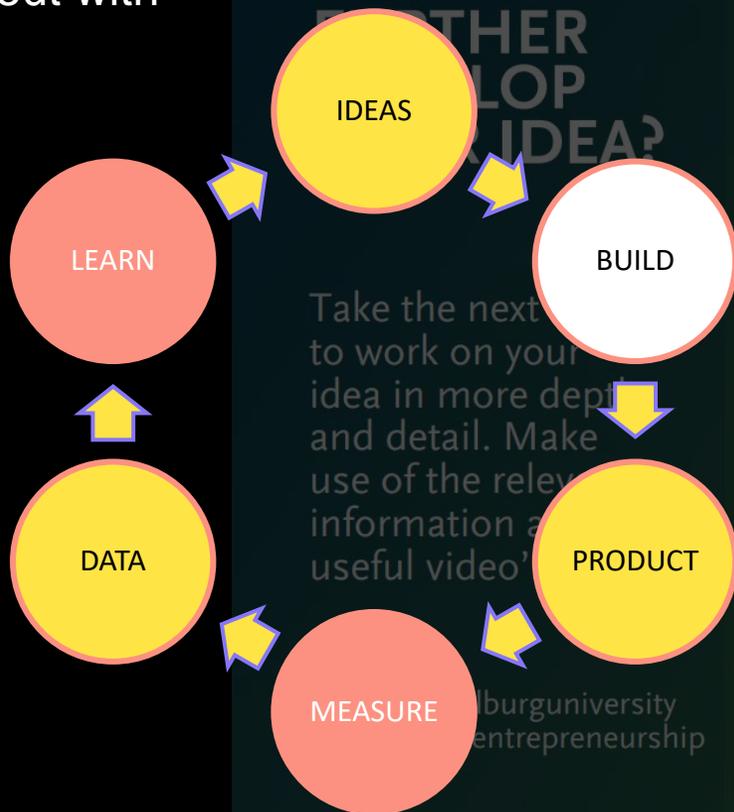
		<b>Precision</b>	<b>Recall</b>	<b>F1</b>	<b>PR-AUC</b>	<b>MCC</b>
Self-reported VVR	ANN	0.47	0.69	0.56	0.68	0.44
Personality	ANN	0.50	0.72	0.59	0.45	0.40
Facial Muscles	DT	0.40	0.76	0.52	0.61	0.19
ITI	ANN	0.42	0.63	0.50	0.45	0.30
Video (Xception) with LSTM	2DCNN	0.66	0.68	0.67	0.73	0.43
Video (ResNet152) with Gru	2DCNN	0.86	0.58	0.69	0.81	0.56



# STEP 3: BUILD

Build a small MVP

And dare to go out with it



# IQONIC

**FOCUS** 1  
WHAT? FOR WHO?  
Must see  
▶ Lean startup ▶ Lean canvas  
Should do  
Fill in a Lean canvas  
▶ Lean canvas

**DERISK** 2  
CHECK YOUR ASSUMPTIONS & TALK TO POTENTIAL CUSTOMERS  
Must see  
▶ Experiment Board ▶ Riskiest Assumptions  
▶ Customer Interviews ▶ Early Adopters  
Should do  
Fill in an Experiment Board and interview at least 10 Potential users of your idea  
▶ Experiment Board

**BUILD** 3  
TEST YOUR SOLUTION WITH POTENTIAL CUSTOMERS  
Must see  
▶ Pivot ▶ Measure ▶ MVP  
Should do  
Make an MVP and test your solution.

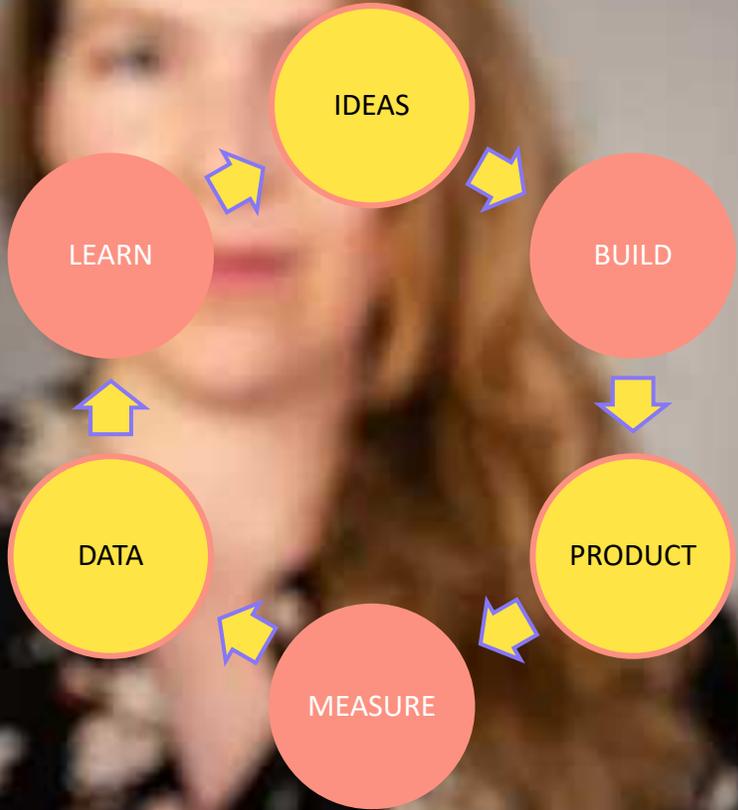
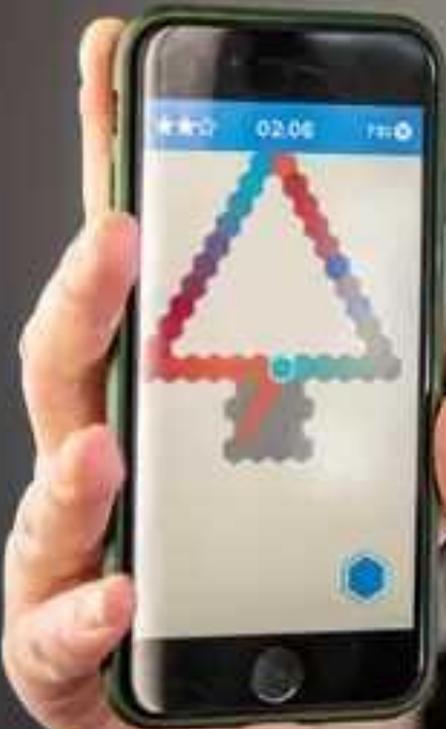
**PITCH** 4  
PITCH YOUR IDEA WITHIN 1 MINUTE  
Must see  
▶ Pitch  
Should do  
Complete your madlib.

MY STARTUP, \_\_\_\_\_  
IS WORKING ON \_\_\_\_\_  
TO HELP \_\_\_\_\_  
TO SOLVE \_\_\_\_\_  
BY \_\_\_\_\_

**READY?** ✉  
Register for an expert-hour  
With a business developer to  
Receive more coaching & feedback.

# IQONIC

Business where society benefits



# PROBLEMS...

The MVP was bad.

# The Game Now

Slide and fly through hills and forests with your avatar...

Press on the screen when you want to speed up

Release your finger when you want to jump

Press again to time your landing

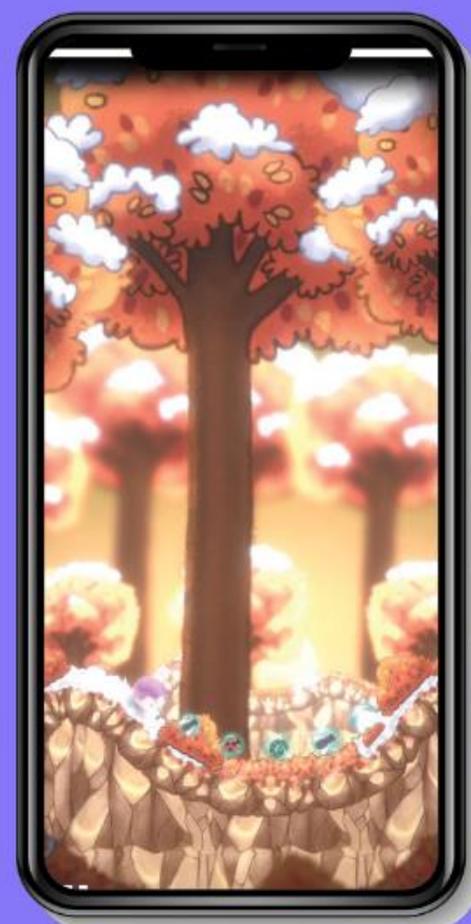
Time it just right and get into the flow...

Check out AINAR.IO on the play/appstore

AINAR.IO



# The Magic



# First results

- **81%** wants to be given access to AINAR.
- **72%** would play again
- **67%** thinks AINAR would improve their experience.
- **57%** thinks AINAR would improve their procedure.



# Building a team

Cindy  
van Goor  
MBA



Chief Executive Officer

dr. Elisabeth  
Huis in 't Veld  
MBA



Chief Science Officer

Judita  
Rudokaité  
MSc

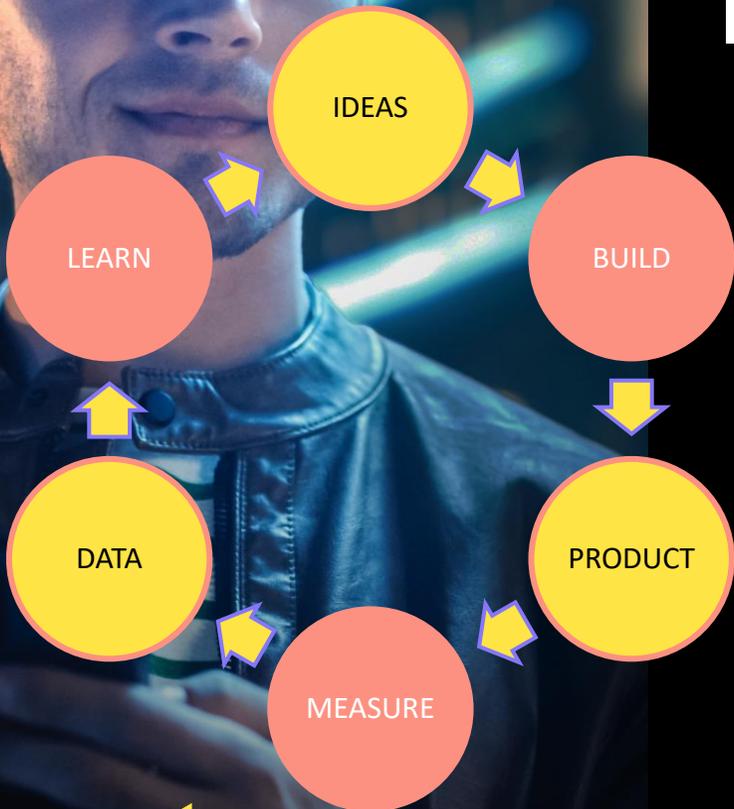
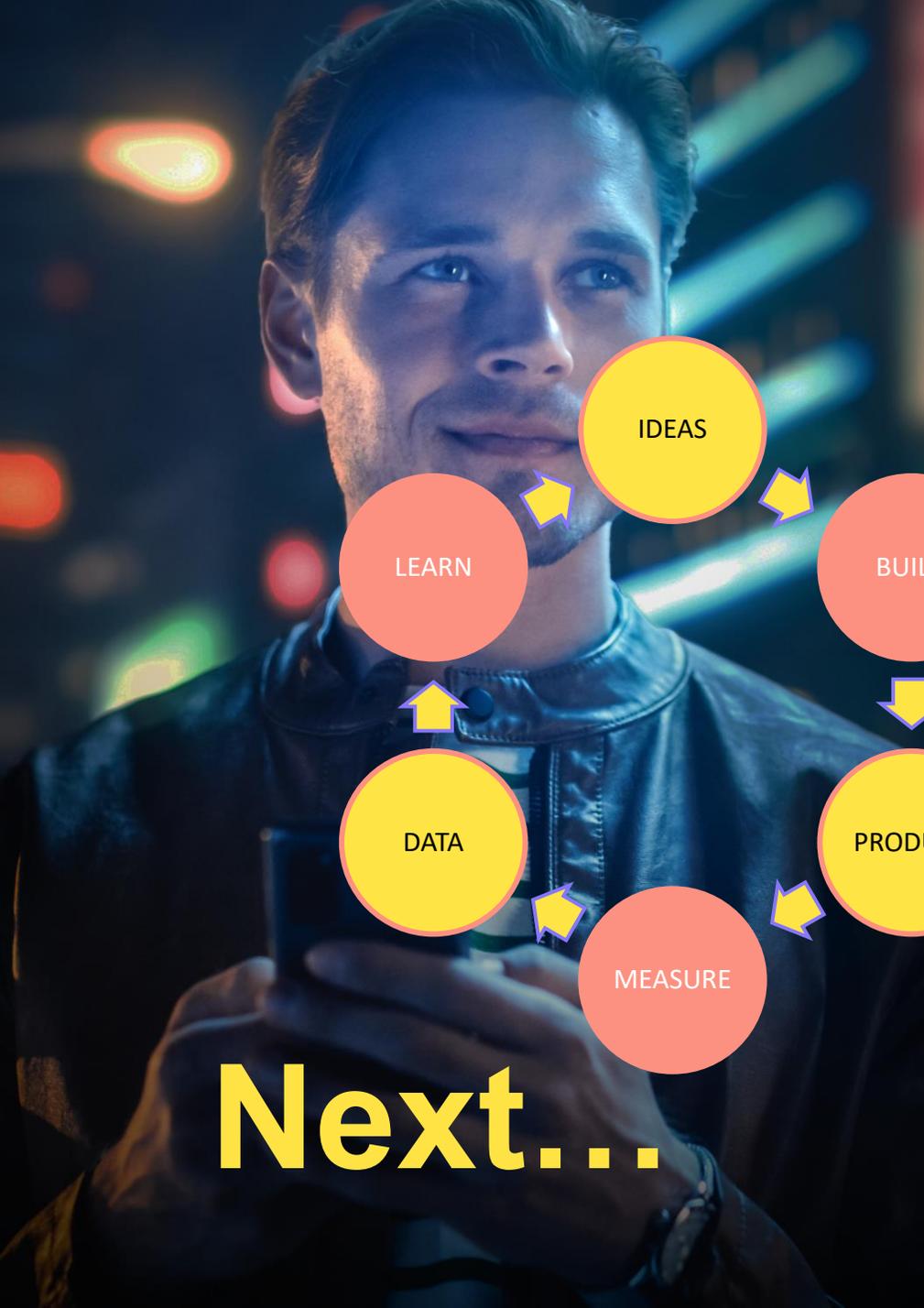


Chief Technology Officer

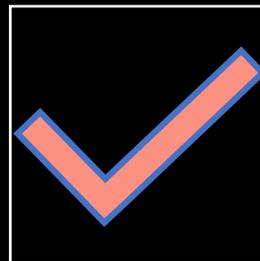
ir. Stefan  
Nieuwenhuijsen  
MBA



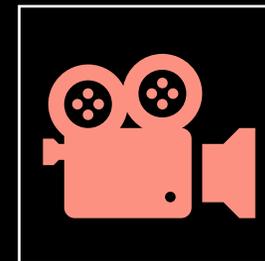
Chief Operating Officer



**Next...**



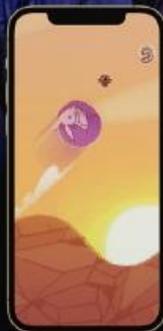
Validate with healthcare organisations



Collect more data, preferably on different patients, ethnic groups, etc.

**AINAR  
LAAT  
JOU IN  
CONTROL.**

**EEN PRIK VERWIJDERD  
VAN ONTLADING**



**+ Preventative**

**+ Gives control to the patient, without requiring staff intervention**

**+ Personalized**

**+ Scalable**

At the level of your solution:

I.e. Imagine your solution takes off

What would the **costs** be for development, implementation, maintenance, growth, use, etc?

For you or for your user/customer.

❖ In case your **start-up** is paying it: How do you expect to get back these costs?

❖ If your **customer/user** is making the costs: what do they get back for making these costs?

**LEAN CANVAS**

COMPANY \_\_\_\_\_ DATE \_\_\_\_\_ VERSION \_\_\_\_\_

<b>PROBLEM</b> - List your top 1-3 problems	<b>SOLUTION</b> - Outline a possible solution for each problem	<b>UNIQUE VALUE PROPOSITION</b> - Single, clear, compelling message that states why you are different and worth paying attention	<b>UNFAIR ADVANTAGE</b> - Something that cannot easily be bought or copied	<b>CUSTOMER SEGMENTS</b> - List your target customers and users
<b>EXISTING ALTERNATIVES</b> - List how these problems are solved today	<b>KEY METRICS</b> - List the key numbers that tell you how your business is doing		<b>CHANNELS</b> - List your path to customers (inbound or outbound)	
<b>COST STRUCTURE</b> - List your fixed and variable costs		<b>REVENUE STREAMS</b> - List your sources of revenue		

TILBURG UNIVERSITY Get ready for the next step. [Tilburguniversity.edu/iqonic](http://Tilburguniversity.edu/iqonic) IQONIC

This Business Model Canvas is adapted from The Business Model Canvas (www.businessmodelgeneration.com) and is licensed under the Creative Commons Attribution-Share Alike 3.0 license.

## TAKE AWAY MESSAGE

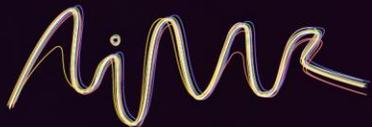


- Understand the (biological) mechanisms
- Use theory and knowledge
- Make DS/AI work for you...not you for the AI!
  
- ASK ASK ASK ASK (the right people)
- And ask it ASAP!
  
- Build, test, validate, rinse repeat
- Find a good, complementary team!

**Elisabeth**

e.m.j.huisintveld@tilburguniversity.edu

# Questions?

The Ainar logo is a stylized, handwritten-style wordmark in a light blue color, positioned in the bottom left corner of the slide.

**Ainar**

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