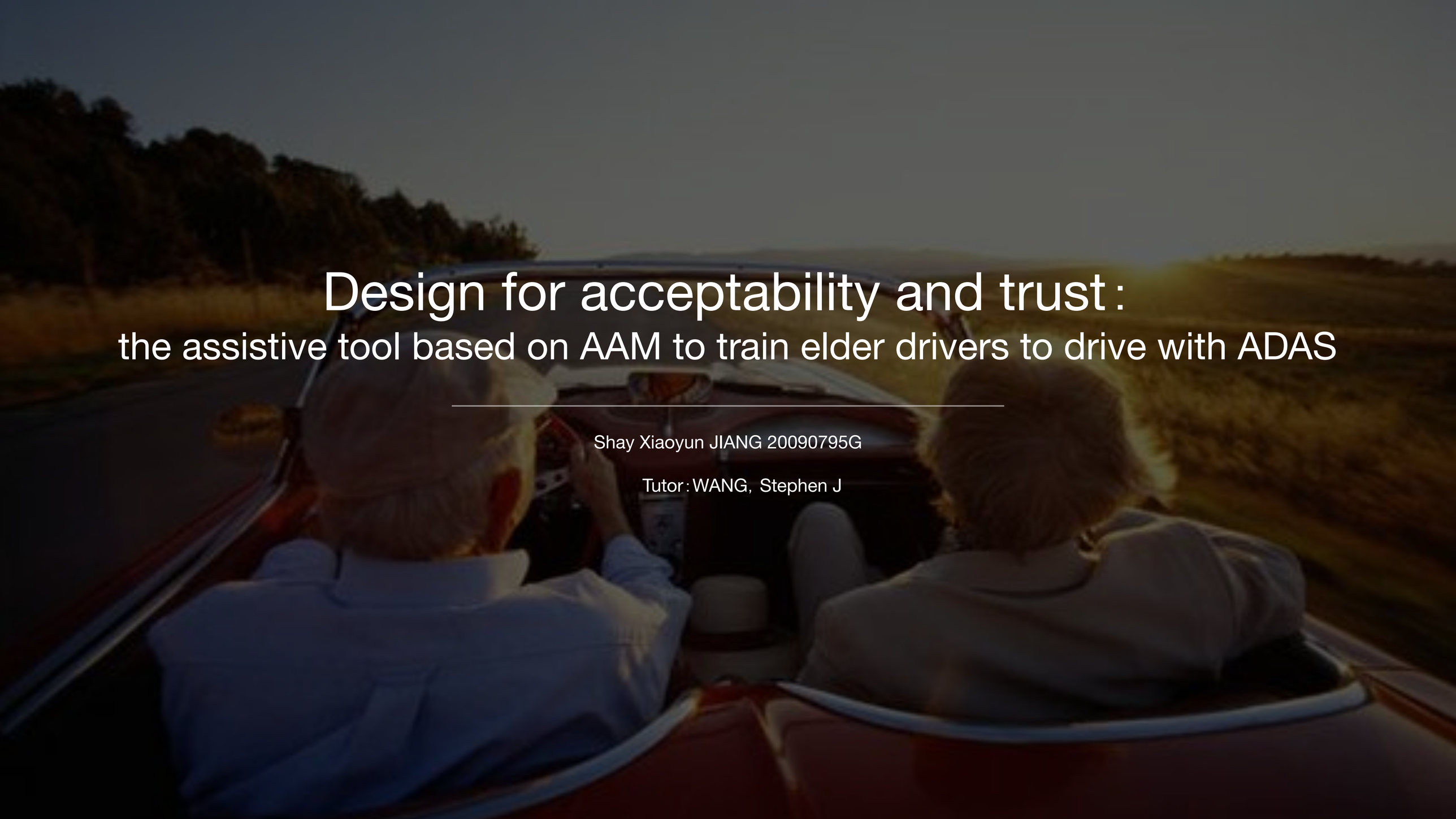

Design for acceptability and trust：
the assistive tool based on AAM to train elder drivers to drive with ADAS

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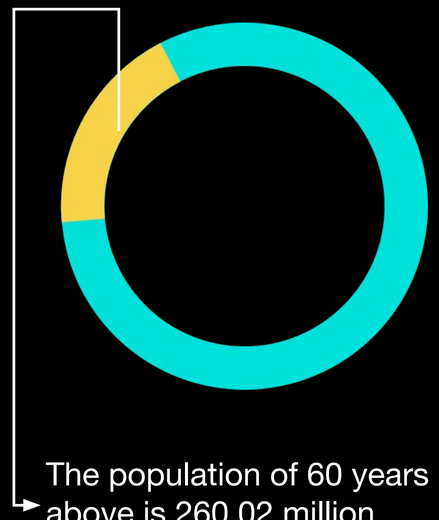
Tutor：WANG，Stephen J

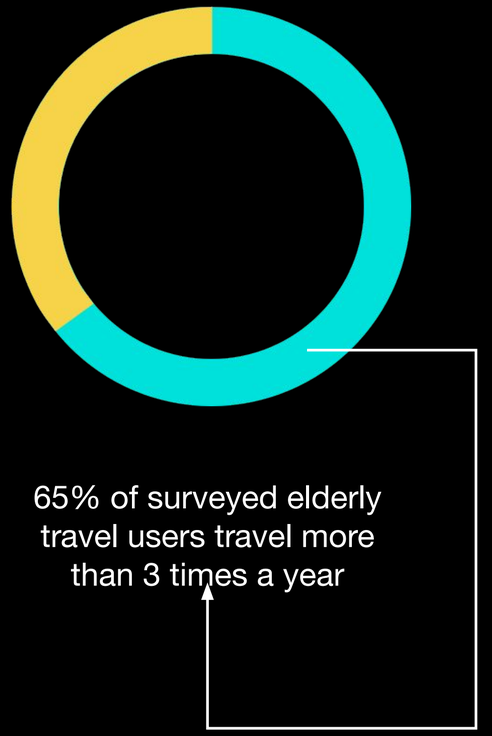
BACKGROUND

Pay attention to late middle-age and older people



The population of 60 years old and above is 260.02 million, accounting for 18.70%.

In 2030, China's smart car penetration rate will reach 95%, about 38 million vehicles



65% of surveyed elderly travel users travel more than 3 times a year

- The aging population is gradually increasing, the rate of smart cars is gradually increasing, and the elderly are potential users.
- The elderly have a wide range of travel needs, and the demand for self-driving travel is gradually increasing.

USER DESCRIPTION

People who are over 55 years old

Would like to choose the retired life of self-driving travel

Less familiarity with new technologies than younger adults due to decreasing physical and cognitive capabilities

Think highly of smart technologies in electronic cars

Be aware of technological benefits

Less trust the ADAS

Be willing to try new, useful technologies

Have the learnability problems

RESEARCH GOAL & PROCESS

Research goal

· Exploring the relation between trust, acceptance and adoption

· Synthesize the data of cognition condition, ADAS knowledge and acceptance level of ADAS among older drivers

· Find an approach to improve the trust level of ADAS

· Teach the elder users to adopt ADAS properly

Initial user research

Get the groups users features

literature review

Analyzing the factors influences the trust

Advanced Technology Acceptance Model

Automation Acceptance model

Acceptance of technologies

Build Acceptance Model based on group features

Examine users acceptance and trust level

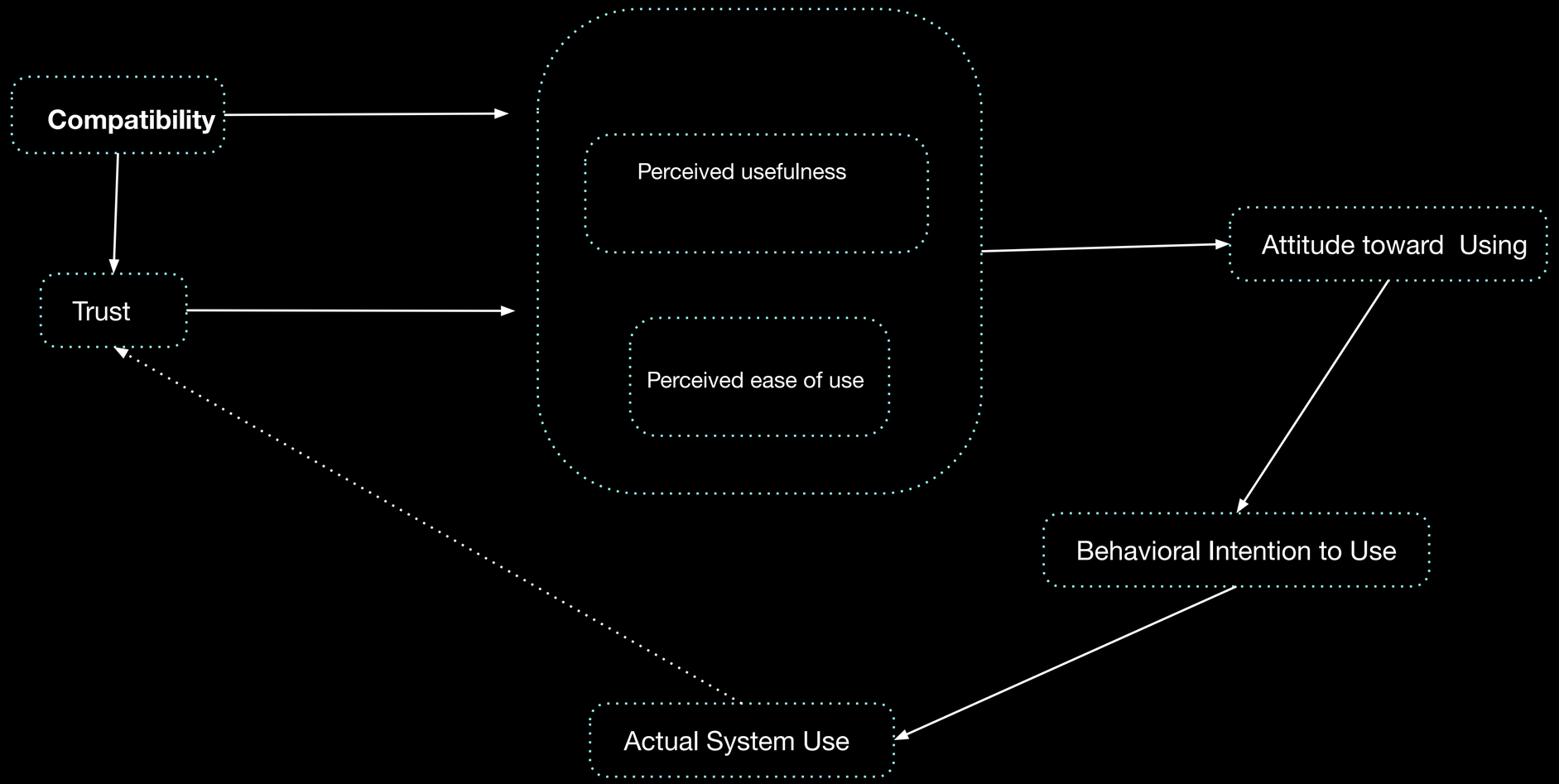
Direction of training tools

Training model and training game

RESEARCH QUESTIONS

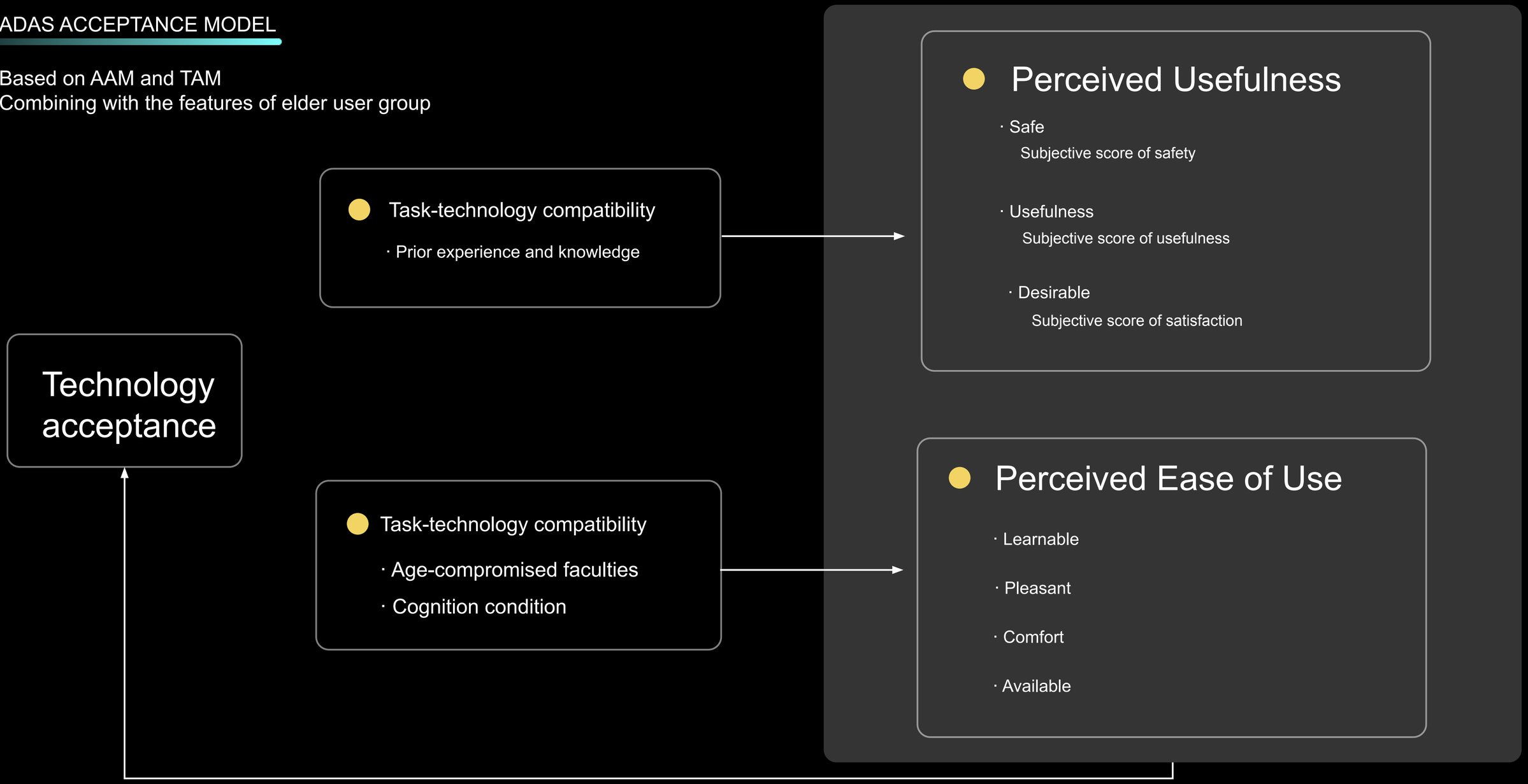
The relation between trust, acceptance and technology adoption

Trust has also been considered as a direct determinant of behavior intent



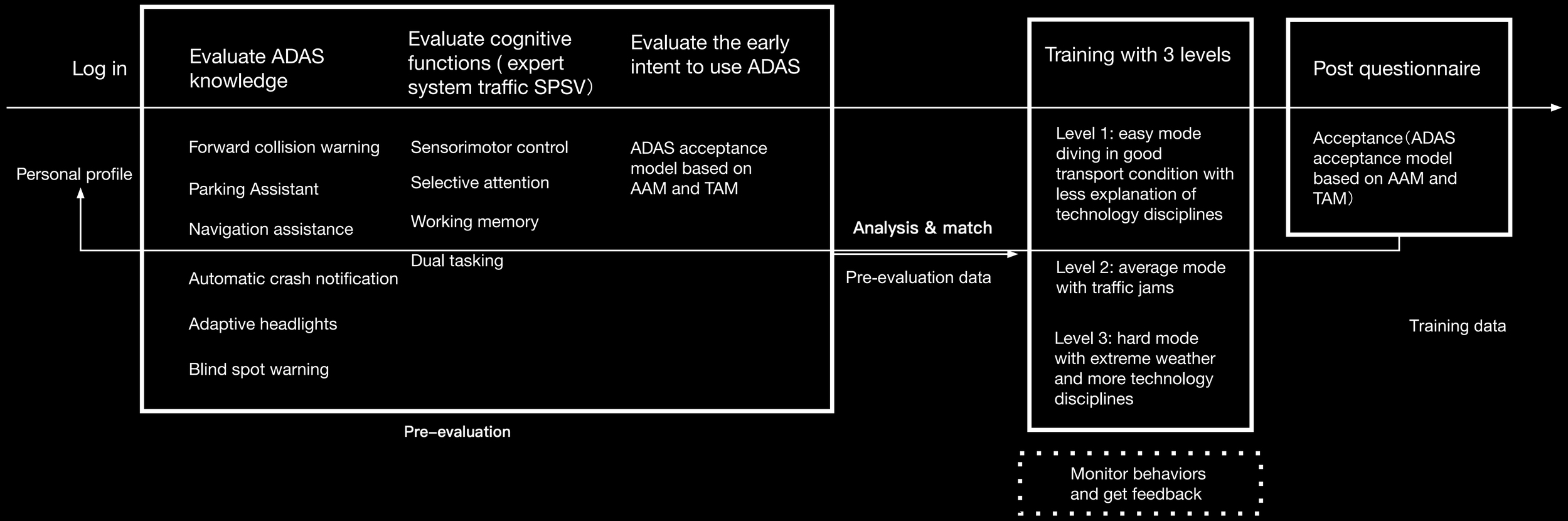
ADAS ACCEPTANCE MODEL

Based on AAM and TAM
Combining with the features of elder user group



TRAINING MODEL

Aim
- Use: evaluate how older drivers use ADAS
- Perception: evaluate what they think about the technologies
- Training: teach the use of ADAS
- Acceptance: examine and increase the acceptance level of the technologies



VARIABLES & EVALUATION

PU

1. Compared with driving without advanced driving assistance systems, do you feel safe to drive?

Very unsafe 1 2 3 4 5 6 7 Very safe

2. Do you think the advanced driver assistance system meets your requirements?

Very dissatisfied 1 2 3 4 5 6 7 Very satisfied

3. Compared with driving without advanced driver assistance systems, do you feel accustomed? (External variables, ie experience)

Very unaccustomed 1 2 3 4 5 6 7 Very accustomed

4. Do you find the advanced driver assistance system useful?

Very useless 1 2 3 4 5 6 7 Very useful

TA=（Avg（PU+ PEOU）/ C RatingScale ）X 100%

PEOU

1. Compared with cars without advanced driving assistance systems, do you feel unpleasant?

Very unpleasant 1 2 3 4 5 6 7 Very pleasant

2. Compared with cars without advanced driver assistance systems, do you feel comfortable driving?

Very unpleasant and comfortable 1 2 3 4 5 6 7 Very comfortable

3. I think it is easy to let ADAS do what I want it to do

Not easy 1 2 3 4 5 6 7 very easy

4. Learning to use ADAS is easy for me

Not easy 1 2 3 4 5 6 7 very easy

TRAINING

YOUR VIRTUAL INSTRUCTOR

The training game for ADAS a simulating in-vehicle driving

Hypothesis：simulating training with technology knowledge would improve the acceptance level

Aim：
Safe transition from traditional cars to smart vehicles with ADAS
Help old adult drivers adopt, understand, trust and properly use ADAS
Help old users to learn technical knowledge of ADAS
Improve the acceptance and trust of this technology

3 steps
Evaluating users previous knowledge and the level of acceptance
Matching proper training level
Post-evaluation of knowledge and acceptance level

Basic functions：

Forward collision warning

Parking Assistant

Navigation assistance

Automatic crash notification

Thoughtful suggestion：

Relationship（ with best friends，children）

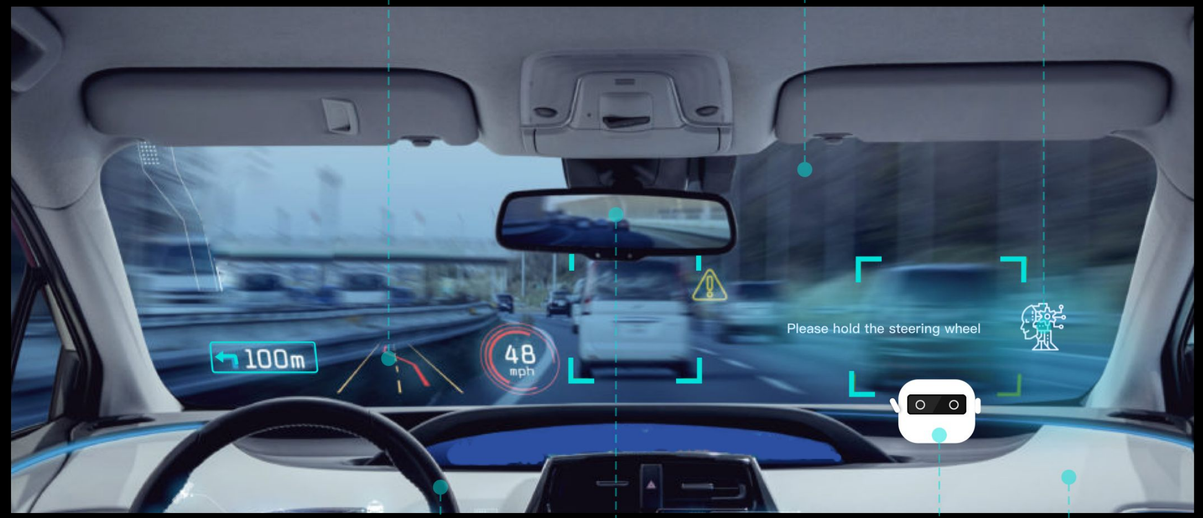
Preference（ restaurants，sports）

Daily routine

Avatar as virtual instructor

Training scenarios with different levels

Technical desciplines tought to users



Force feedback from users

Agency with voice assistant

Monitoring users

Simulated cockpit

TRAINING

Game levels

Level1. Driving on a highway with speed variations and emergency cars

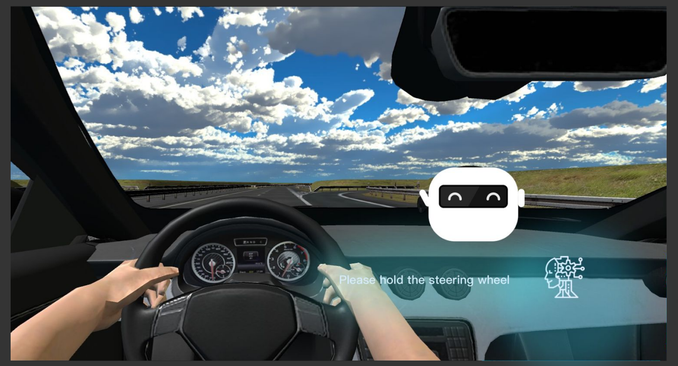
Level2 . Driving in an urban environment with traffic jams and emergent situations

Level3 . Driving in an unfamiliar environment with snowy weather

Game process

Match the game level

Start



Instruction process

Game over and complete the instruction

TEST of GAME

Act quickly to the voice reminder

Game was attractive

Easy to get the knowledge of when to take over and hand out driving

Important information was not defined clearly

Need more interactions when training

NEXT STEP

- Iterate the game with more levels
- Test the training model within target users
- More data to test the hypothesis