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N-of-1 Field trial Motivation in Your Pocket: Supporting physical activity and healthy diet with a gamified smart phone app

BACKGROUND Scalable, cost-effective interventions that increase health behaviours are vitally important for reducing incidence of life-style related conditions and their economic impact.

The PREventive Care Infrastructure based On Ubiquitous Sensing (PRECIOUS) project builds a motivational smart phone service with transparent sensors for activity & stress.

MOTIVATING FOR SELF-REGULATION WITH EVIDENCE-BASED TECHNIQUES

INCREASING MOTIVATION

The app targets self-determination theory based

- 1 **Autonomy** through self-endorsed goals and activities. User behaviour triggers suggestions: The recommended feature lights up and sends a notification
- 2 **Competence** through goal achievement
- 3 **Relatedness** through competition and collaboration
- 4 **Fun** through gamification

Motivational interviewing inspired design

- Eliciting change talk
- Not going ahead the person's readiness to change
 - Low activity → motivational support
 - High activity → support for action
- Evoking the person's own motivations for change
- Strengthening confidence

5 SELF-REGULATORY BEHAVIOUR CHANGE TECHNIQUES

Discrepancy between behaviour and goal

- Daily, achievable goals
- Self-monitoring
- Feedback on behaviour

4 Gamification → Sustained use

- Narrative
- Rewards
- Visualisations

FIELD STUDY METHOD

Participants: 12 inactive adults

Procedures: Objective data from the app use + activity bracelet + heart rate variability measurements (FirstBeat).

Self-reported responses and self-monitoring records

Outcomes: BCT use, physical activity, completed dietary challenges, usability and feasibility evaluations

Interventions: During the 6 week field study the app provides each user with a dynamic, personalised trajectory through the app, including reminders, prompts, and gamified feedback and reward mechanisms.

Analyses: Mixed methods: Intra-individual variance will be studied with the N-of-1 method and time-series analyses. Usability is investigated with interviews and think-aloud walkthroughs in design phase and after the intervention.

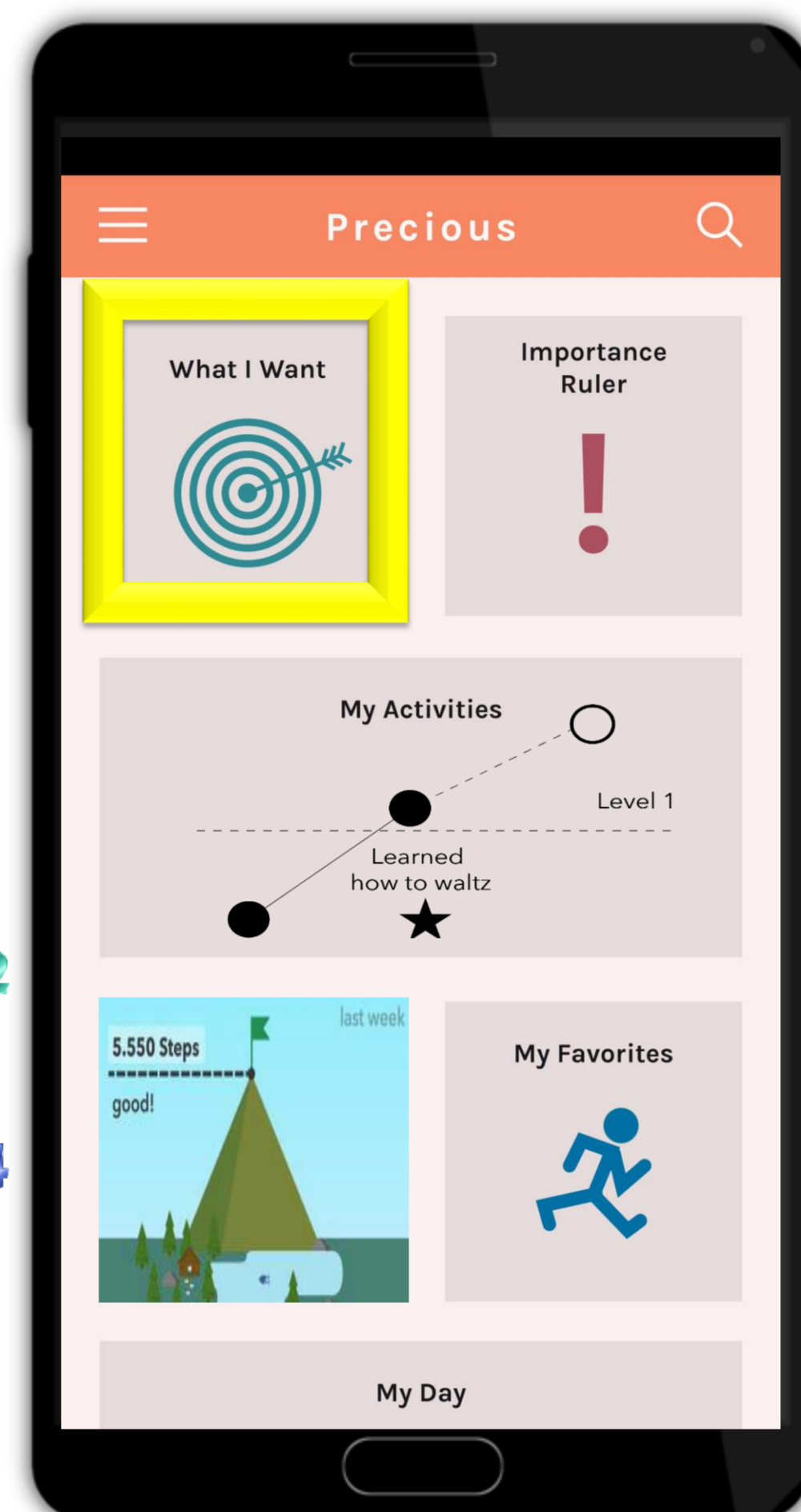


Fig. 1. Personalised main menu

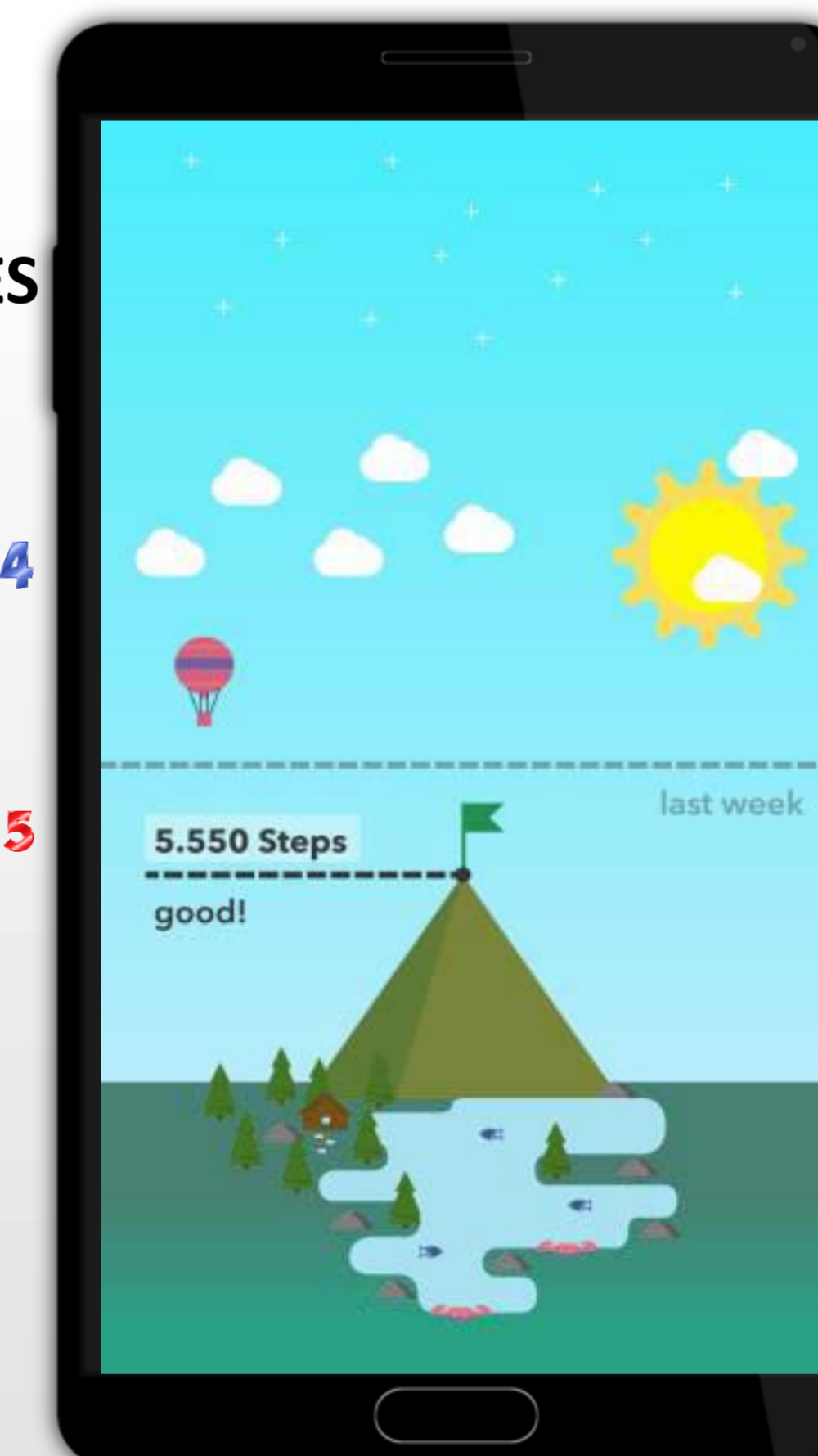


Fig. 2. Control theory based self-regulation techniques

AIMS

- Increase use of self-regulation elements
- Increase physical activity and healthy food choices
- Identify individual trajectories of change
- Identify factors that increase/mitigate engagement and effectiveness within individuals

RESEARCH QUESTIONS

Feasibility

Do the motivational interviewing based features elicit change talk?

How do the users perceive the constant tracking and interactive nature of the app?

Behaviour change

Which service features/behaviour change techniques were used and why?

Did the motivational features lead the user to self-regulation techniques?

Did the use of self-regulation techniques increase physical activity (compared to periods when self-regulation features were not available)?

Did the service help users reach their behavioural & outcome goals and what preceded that?

TAKE-AWAYS

PRECIOUS field study will

- identify components crucial to increasing intervention engagement and activity
- suggest new possibilities for intervention tailoring based on integrated sensor data
- offer motivational interviewing techniques digitalised in smart phone

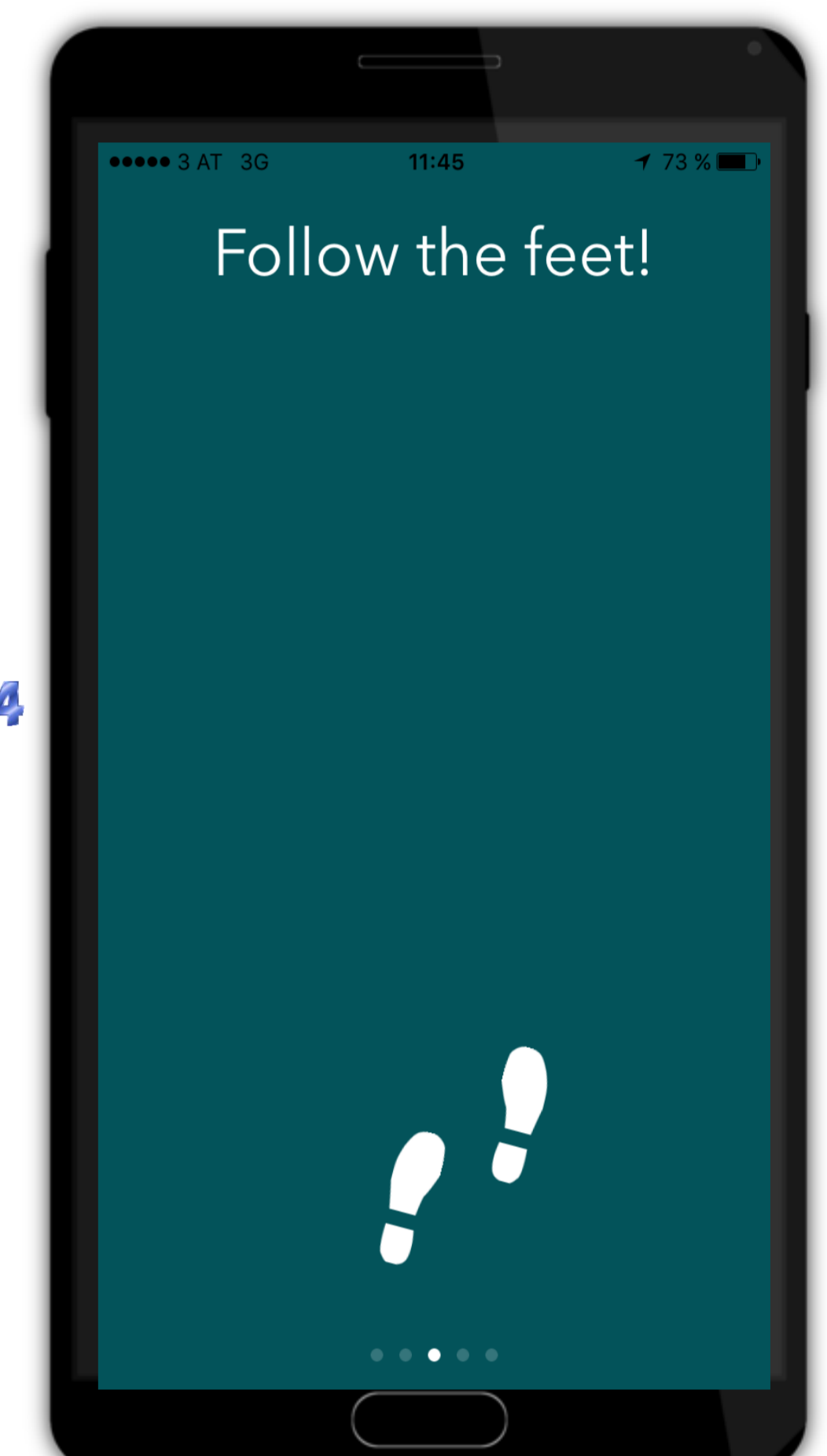


Fig. 3. Familiarising the user with the interactive sensors

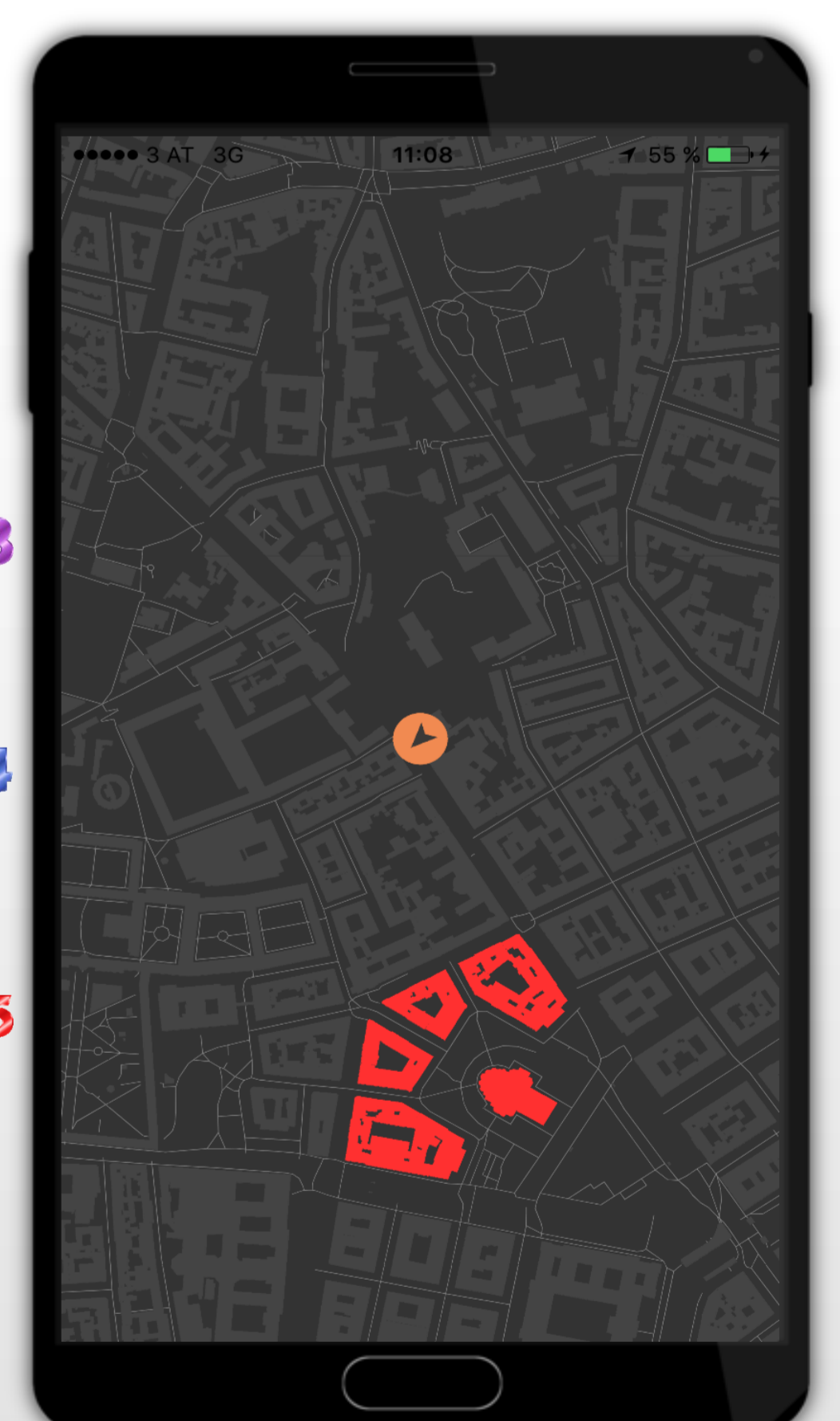


Fig. 4 Conquer the City: A GPS based activity challenge in which you conquer and defend areas with and against others.

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