



UNIVERSITY OF
MAURITIUS

Health and Wellness 2.0: Assessing the Impact of Exergaming Application for the Promotion of Health Behaviours in Mauritius

TEAM

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Funded by the Mauritius Research and Innovation Council (MRIC)
(MRIC/SISM/HW-18)

INTRODUCTION

- Sedentary lifestyles and rise of non-communicable diseases (e.g., diabetes, obesity).
- Role of physical activity in health improvement.

The Mauritian context:

- Prevalence of diabetes is 19.9%
- Obesity prevalence is 36.2% (29.9% among men and 41.6% among women).
- Only 23% of Mauritian adults meet the WHO recommendations of 150 weekly minutes of physical activity.

(Mauritius Non Communicable Disease Survey, 2021)

Mental health

- 22.2% of people interviewed had a mental illness
- 15% had signs of depression, anxiety and related disorders.

(Mauritius Institute of Health and the Ministry of Health and Quality of Life, retrieved 2025)



EXERGAMING AS A POSSIBLE SOLUTION

- Exergaming:
 - Interactive technology-driven gaming that promotes physical activity and nutrition
- Importance in Health Promotion
 - Potential in reaching wider audiences
 - Novel approach to combat sedentary lifestyles and associated health risks
- Gaps in current exergames (cost, cultural adaptability, and scalability).
- We therefore, propose BehaviourCoach!



OBJECTIVES OF BEHAVIOURCOACH 2.0

1

Promote physical activity and healthy behaviours.

2

Offer an accessible, engaging, and adaptable gamified solution.

3

Eliminate the need for specialized equipment.

KEY FEATURES

- A framework to enable therapists develop mobile/web-based interventions.
- Monopoly-style board game integrating fitness tasks.
- **Two game modes:**
 - Local Mode: Shared device in one location.
 - Online Multiplayer: Participants connect remotely.
- Customizable content to suit demographic profiles.
- Real-time tracking and data analysis.



RESEARCH OBJECTIVES

To customise the *BehaviourCoach* web application to the social context of Mauritius and Rodrigues, ensuring that health activities are culturally appropriate and engaging.

To conduct a rigorous evaluation of the web app's impact on health behaviours.

To gather insights on user engagement, behavioural changes, and the role of psychological and social factors.

ADMINISTRATOR DASHBOARD

- Grids and Cards Management for customisation.
- User and Room Management.
- Reports on participant progress and engagement.

Behaviour Coach Admin

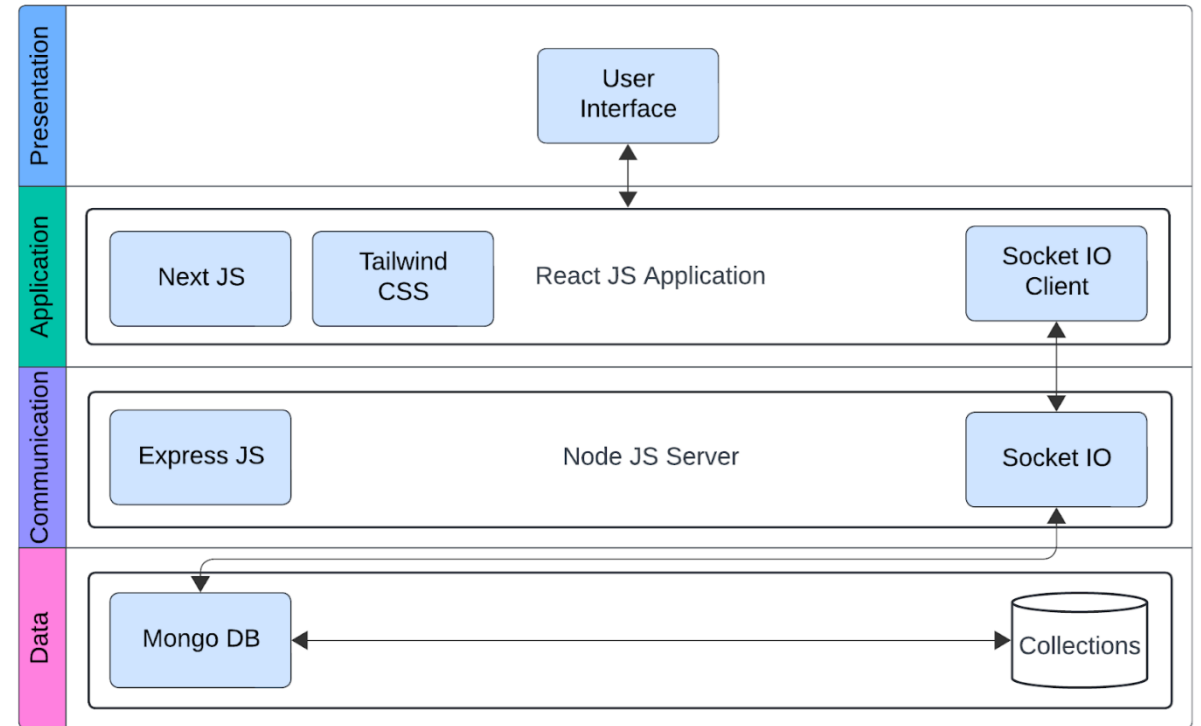
Admin

Save

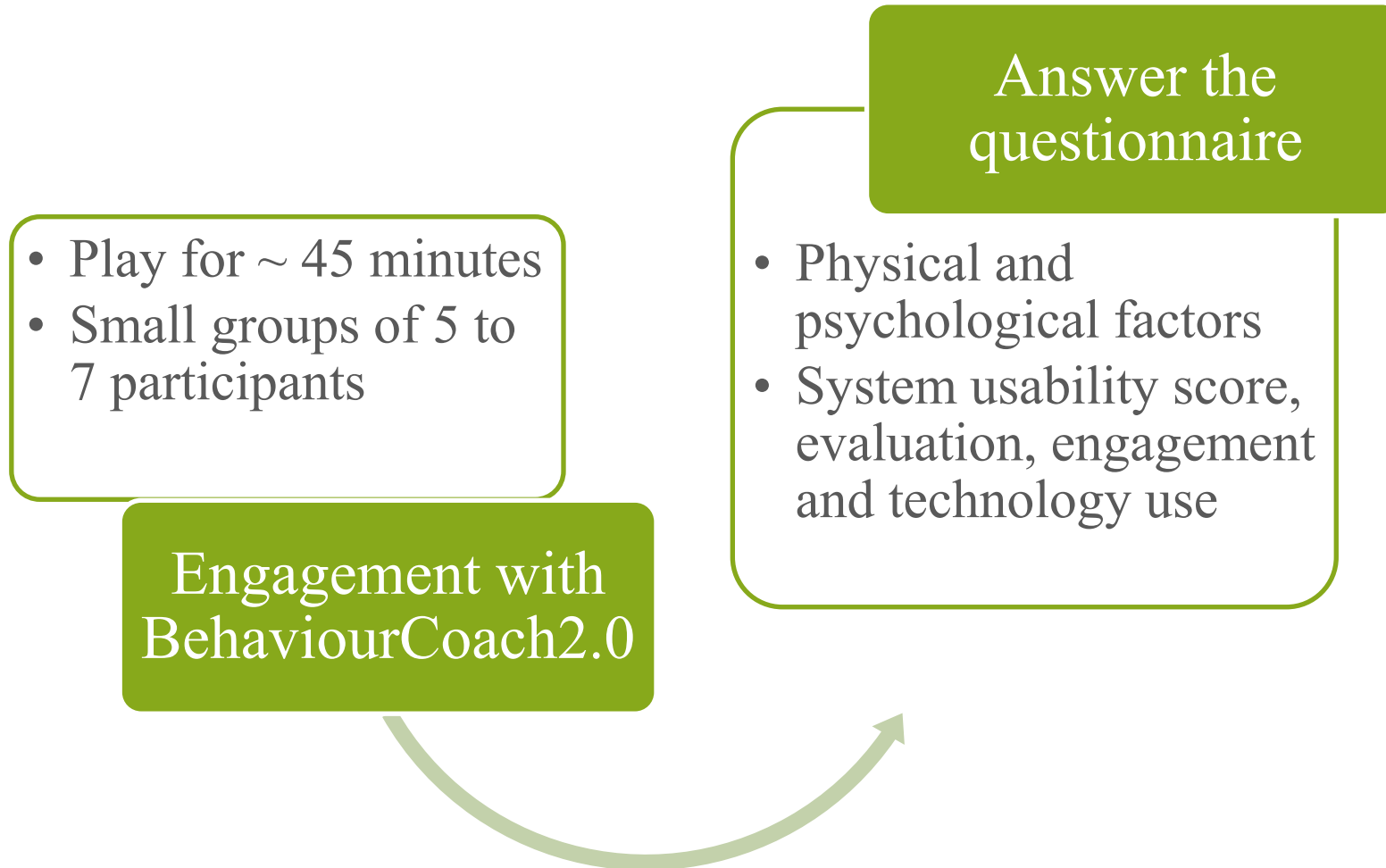
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1	Oxygen Gym	Heart ▾	☒ Yes	120
1	Vitamin Gym	Heart ▾	☒ Yes	120
1		random	☐ Yes	100
1	Body Sculpt Gym	Heart ▾	☒ Yes	150
1	Le Pouce Track	Breath ▾	☒ Yes	150
1		random	☐ Yes	100
1	Chamarel Track	Breath ▾	☒ Yes	180
1	Pieter Both Track	Breath ▾	☒ Yes	200
1	EDUCATION	education	☐ Yes	100
1	Beach Spa	Mental ▾	☒ Yes	220
1	Sea Spa	Mental ▾	☒ Yes	240
1		random	☐ Yes	100
1	Moka Spa	Mental ▾	☒ Yes	260
1	Nature Park	Creative ▾	☒ Yes	270
1		random	☐ Yes	100

DESIGN AND DEVELOPMENT

- User-centered design approach.
- Technologies used:
 - Frontend: React and Next.js for responsiveness.
 - Backend: Node.js and MongoDB for scalability.
 - Real-Time Communication: Socket.IO.
- Accessibility: Works on any web-enabled device.

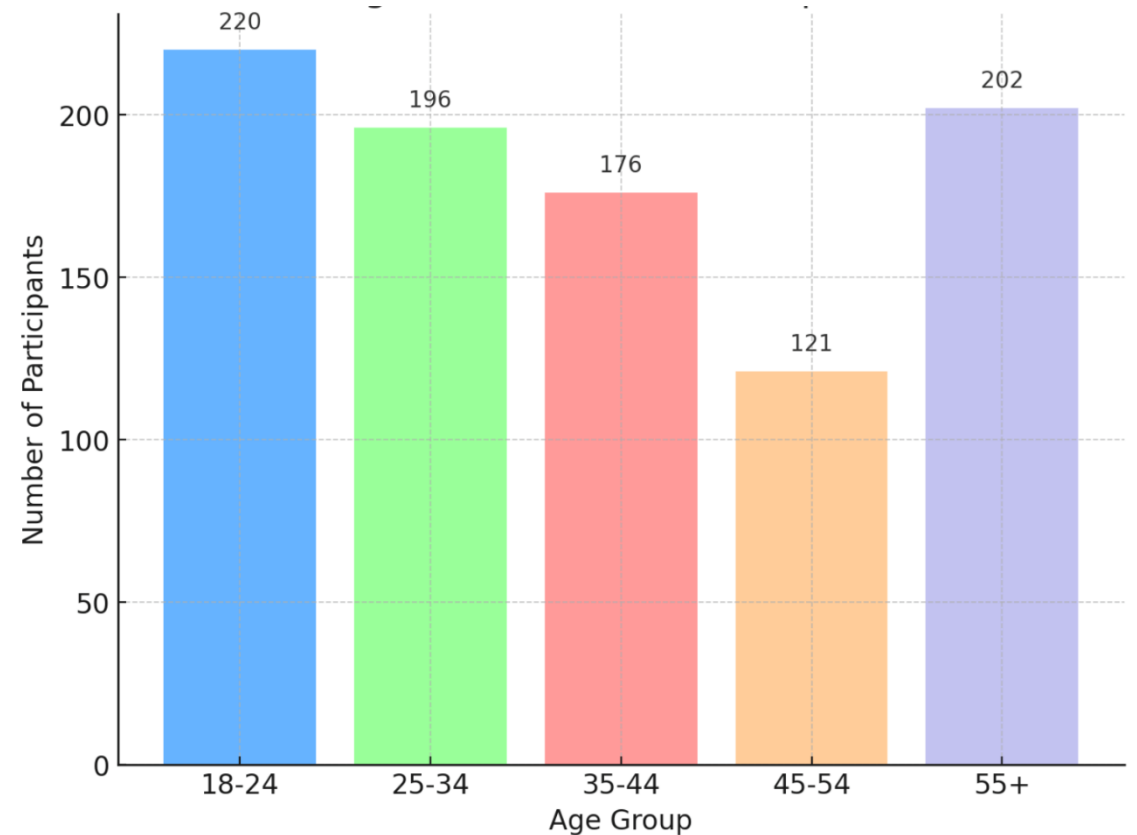


RESEARCH METHODOLOGY



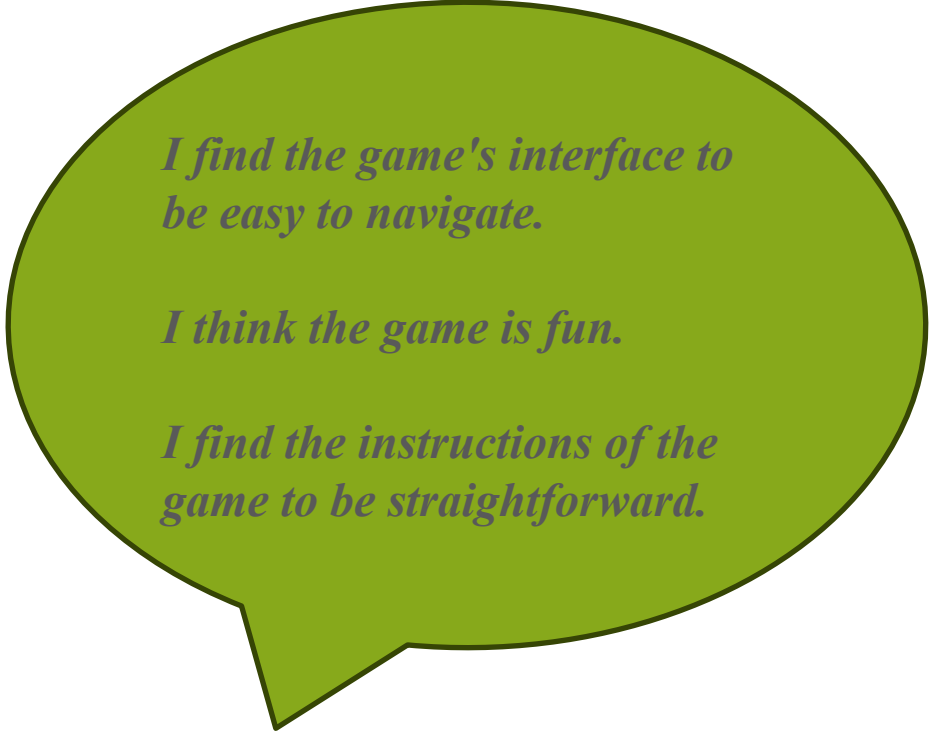
PARTICIPANT DEMOGRAPHICS

- **Sample Size:** 915 participants, representative of the Mauritian population.
- **Age Range:** 18–84 years (Mean: 39.24 years; SD: 15.98).
- **Gender Distribution:**
 - Male: 44.32%
 - Female: 55.24%
 - Prefer not to say: 0.33%



TECHNOLOGY USE AND EVALUATION

- 41.7% of participants reported using technology to monitor their health (versus 58.7% replied NO)
- Participants reported using their smartphone and smartwatch, the smart scale, a digital diary, web application, menstrual cycle tracker.
- Participants had a **very positive evaluation of BehaviourCoach2.0** ($M = 5.68$, $SD = .86$; out of 7 possible points).



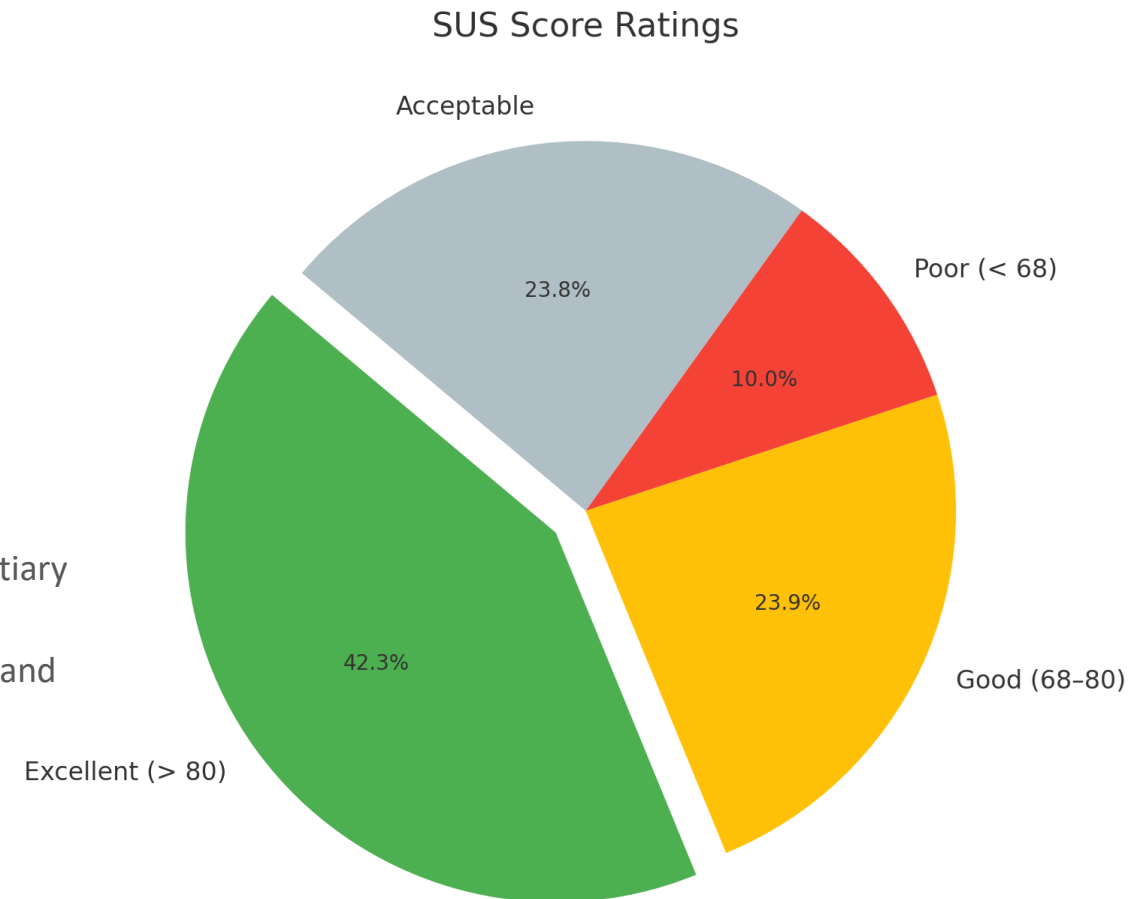
I find the game's interface to be easy to navigate.

I think the game is fun.

I find the instructions of the game to be straightforward.

RESULTS - USABILITY

- **Usability:**
 - **SUS Score:** Mean 77.06 (SD = 19.29).
 - 42.3% rated usability as “Excellent” (SUS > 80).
 - 23.9% rated usability as “Good” (SUS 68–80).
 - Less than 10% rated usability as “Poor.”
- **Demographic Influence:**
 - Consistent high usability scores across:
 - Gender: Male (76.80), Female (77.25).
 - Education: Primary (76.50), Secondary (76.90), Tertiary (78.15).
 - Professional Status: Scores ranged between 76.20 and 77.60.
- **Willingness to Pay:**
 - Average: MUR 439.39 (~USD 9).
 - 55% would pay less than MUR 500 (~USD 10).



PSYCHOLOGICAL FACTORS

- Motivation to engage in health-enhancing behaviors aimed at improving physical condition.
- Motivation to adhere to health professionals' and employers' expectations to engage in health-enhancing behaviors.
- Participants reported to be relatively confident to take care of their mental health ($M=3.63$, $SD=.73$ out of 5 possible points).
- Participants reported lower levels of self-efficacy for physical activity ($M=2.90$, $SD=.99$ out of 5 possible points).

Challenges

- Reliance on self-reported data.
- Short exposure during evaluation (1-hour session).
- Limited longitudinal impact studies.

Future Direction

- Long-term impact studies on health outcomes.
- Integration of AI for personalised recommendations.
- Use of emerging technologies like mixed reality (AR/VR) for engagement.

CONCLUSION

BehaviourCoach is an accessible and effective digital health intervention.

High usability and adaptability make it scalable for diverse populations.

Potential to address global health challenges related to physical inactivity.

LINKED PROJECT - **ASSESSING TECHNOLOGY READINESS AMONG OLDER ADULTS IN MAURITIUS FOR THE FUTURE DEVELOPMENT OF HEALTH AND WELL-BEING PROGRAMMES**

- **Motivation for the Research**
 - Digital health interventions have shown promise in improving health outcomes among older adults and 78% of the population had access to broadband internet (2017)
 - Digital literacy rate is unknown -> usefulness for development of digital health programs including exergames for older adults in Mauritius.
- **Survey using the DLAQE (Digital Literacy Assessment Questionnaire for the Elderly) which is a questionnaire created using validated questionnaires such as :**
 - Rapid assessment of physical activity questionnaire (RAPA) : active / sedentary
 - Mobile device proficiency questionnaire (MDPQ) : ability to use mobile digital devices
 - A subsection of the digital health readiness questionnaire (DHRQ) : interest to engage with digital technologies
- **Performed with 694 respondents (665 sample, Confidence level: 99%; margin of error (CI) of 5%)**
- **Output:** Current state of digital literacy, physical activity adherence and socialisation avenues of older adults (50+) in Mauritius will be known
- **Future work:** data cleaning (started), analysis of survey results.

ACKNOWLEDGEMENTS

- Funding support from the Mauritius Research and Innovation Council (Grant no: MRIC/SISM-HW-18).
- Funding support from the Mauritius Research and Innovation Council (Grant no: MRIC/SISM-HW-16).
- The Investigators:
 - Dr Fiona Grant
 - Mr Shehzad Jaunbuccus
 - Mrs Smita Rampat
- Our Research Assistants and Consultants: Sandy, Cathy, Nowsheen, Azeemah, Yogesh and Darvish
- All our participants from both Mauritius and Rodrigues

Publications

Promoting Physical Activity and Social Engagement in Older Adults through Immersive Exergaming: A Comprehensive Review S Jaunbuccus, R Elaheebocus 2024 International Conference on Next Generation Computing Applications ...		2024
BehaviourCoach: Exploring the Use of a Web-Based Serious Game in Health Promotion F Grant, R Elaheebocus International Journal of Serious Games 11 (2), 27-41	2	2024
Digital Tools in Informal Science Education Sites: A Systematic Literature Review H Ramsurrun, R Elaheebocus, A Chiniah Journal of Science Education and Technology, 1-21	1	2024
Evaluation of BehaviourCoach–An Exergaming Mobile Application Adapted for Mauritius R Elaheebocus, AH Moonien 2023 19th International Conference on Intelligent Environments (IE), 1-6		2023
Exergaming Characteristics in Interventions Addressing Physical Activity and Nutrition: A Systematic Literature Review SMRA Elaheebocus, F Grant EAI Endorsed Transactions on Pervasive Health and Technology 9	2	2023
Behaviourcoach: a customisable and socially-enhanced exergaming application development framework R Elaheebocus, S Beharry, G Caussyram, P Seenan Companion Publication of the 12th ACM Conference on Web Science, 74-75	3	2020



QUESTIONS AND FEEDBACK?

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