Eye Contact for Interaction in Virtual Reality Exposure Therapy for Social Phobia – A Case Study

H. Grillon
F. Riquier
D. Thalmann

Overview

- Introduction
- Related Work
- Experimental Setup
  - Apparatus
  - Architecture
- Experimental Protocol
- Results
- Conclusion

Introduction

- CBT for treatment of social phobia
- Need for virtual character realism
  - Representation
  - Behavior
- Responsive to eye contact
  - Attentive when looked at
  - Bored when not
- Increase of immersion

Related Work

- Object selection and movement
  - Hutchinson et al. [1989], Jacob [1990], Starker and Bolt [1990], Colombo et al. [1995], Tanriverdi and Jacob [2000], Zhu and Ji [2004]
- Character feedback
  - Cassel and Thorisson [1999], Wang et al. [2006]

Experimental Setup - Apparatus

- ISCAN RK-726PCI pupil/corneal reflection tracking system
- Ascension Flock of Birds
- 3.2m x 2.4m back-projection screen (1024x768 pixels)

Experimental Setup - Architecture

- Texture-based color picking technique Herbelin et al. [2007]
- 2 animation pools
  - Attentive
  - Bored
- Use of eye-tracking
- Latency in behavior modification

Experimental Protocol

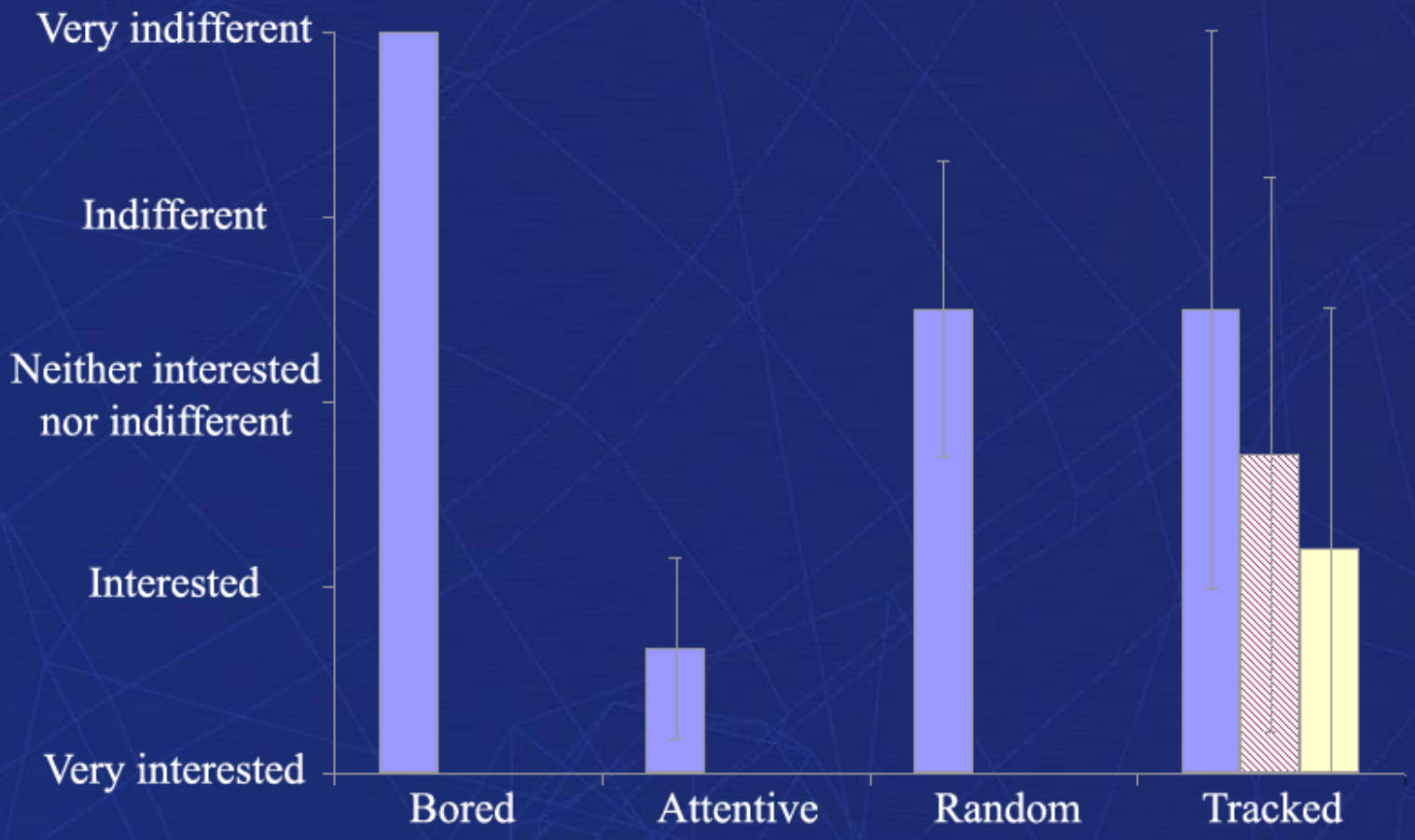
- Hypotheses
  - A character that changes behavior is more realistic
  - With respect to eye-tracking data is even more realistic
- Subjects
  - Background
  - Age

Experimental Protocol

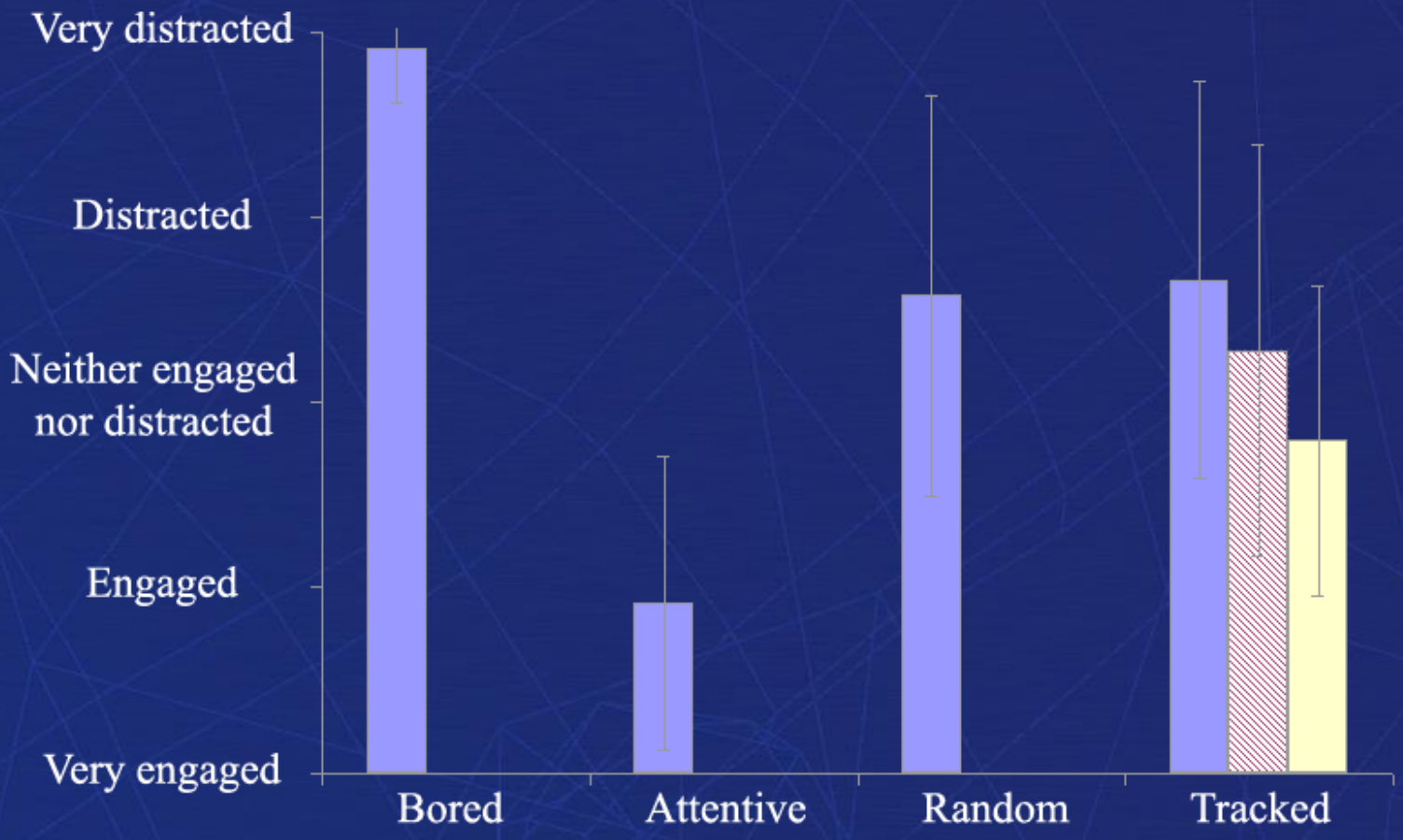
Experimental Protocol

- 5 point Likert scale evaluation of:
  - Interest/Indifference
  - Engagement/Distraction
  - Friendliness/Unfriendliness
  - Normality/Abnormality
  - Other

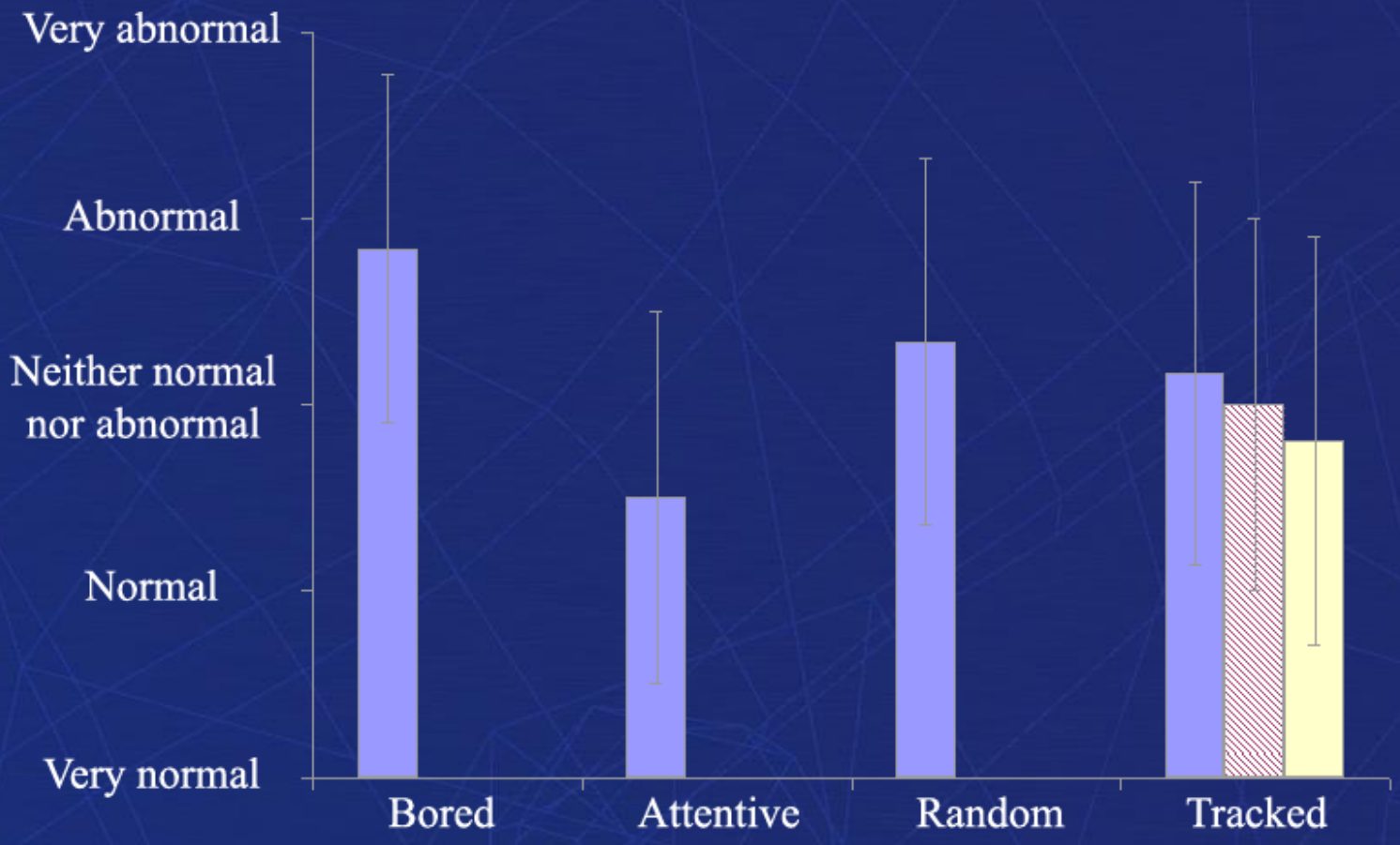
Results - Interest



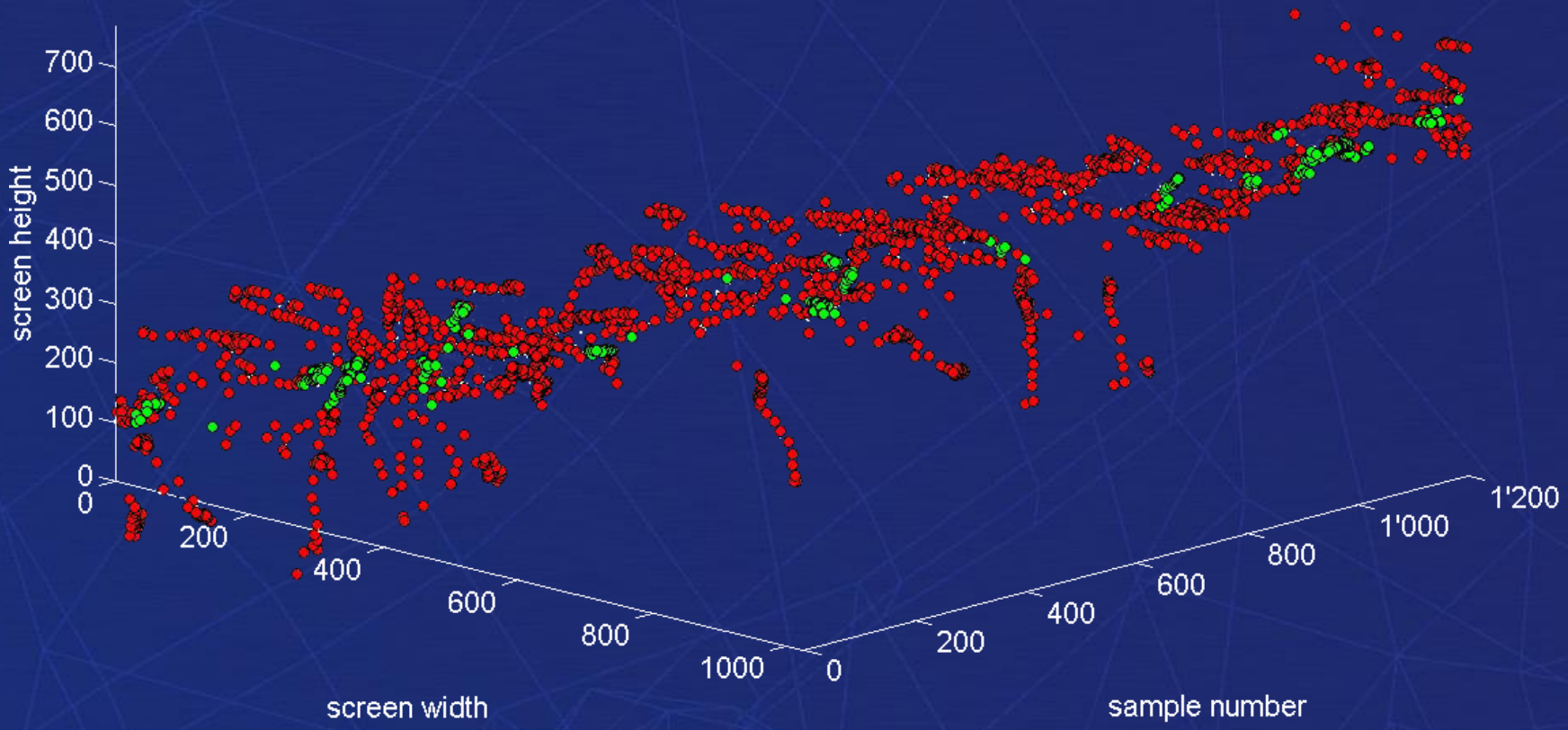
Results - Engagement



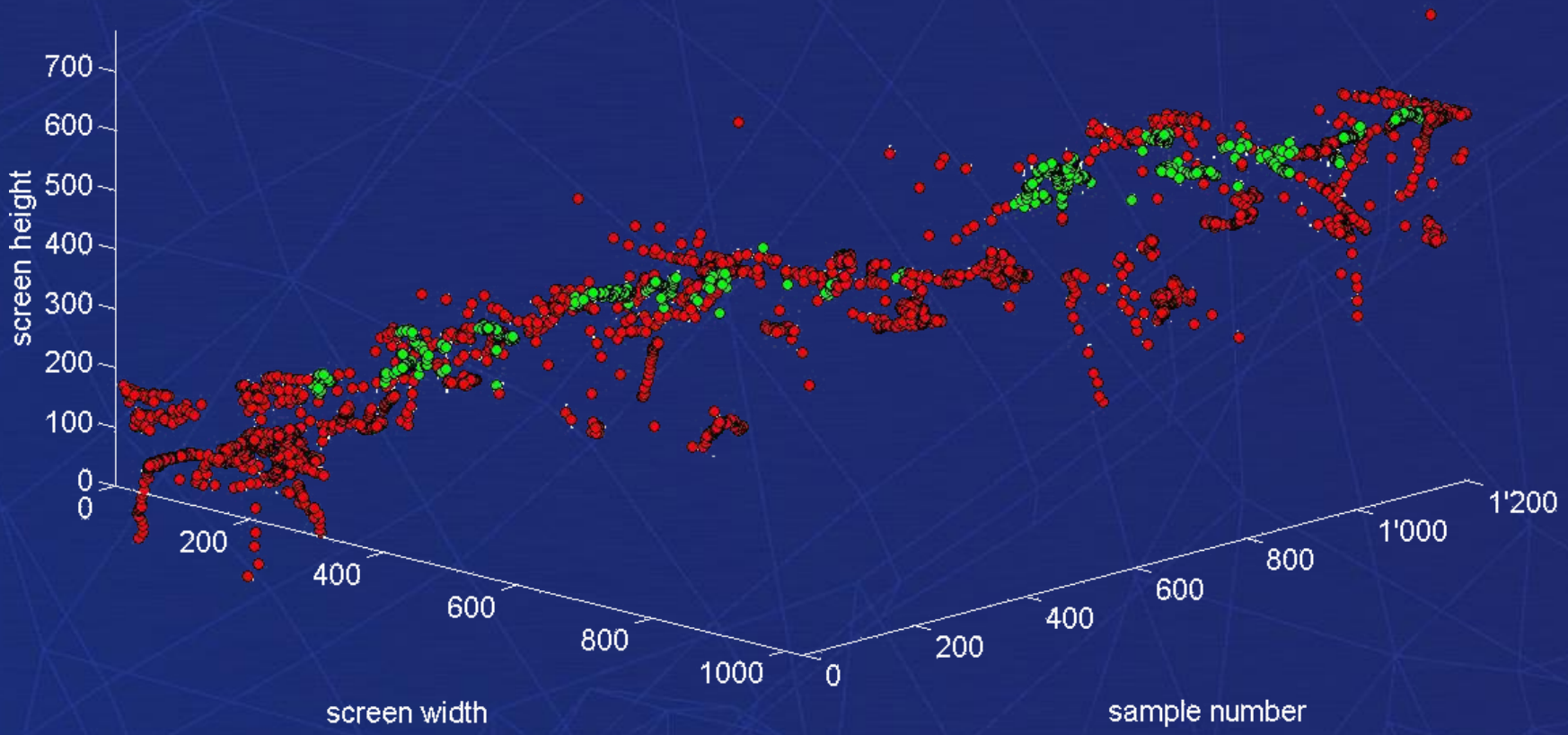
Results - Normality



Results – Case Study - Attentive



Results – Case Study - Bored



Results - Discussion

- Identification of attentive/bored characters
- Scores to normality question confirms our second hypothesis but not fully our first one
- Strong reaction in the case study
- Confirmation with subjective rating

Conclusion

- Experiment using eye-tracking conducted on 12 healthy subjects and a case study
- Potential bias of subjects towards an always attentive character
- Filtering of eye movements to obtain better results
- Promising results
- Further applications for phobic people

Thank you