Wii Game Technology for Music Therapy: A First Experiment with Children Suffering from Behavioral Disorders

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Paris V – Institut de psychologie
Large audience
- Psychological disorders (autism, instability…)
- Neurological disorders (Alzheimer, Parkinson…)
- Adverse effects reduction

Proven efficiency
- Case studies, test-retest methods
- Application in hospitals

Active Analytic Group Music Therapy
(Priesley, Lecourt)
Related Work

CAMTAS, MIDIcreator/Grid
U. of York

Instrumented Footwear
Hyperscore/instruments
MIT Media Lab

PDWii, Remission
Games for Health

MTTB
U. of Jyväskylä
Motivations

Motivational power of video games

Design of therapeutic electronic instruments
  • By the patient
  • By the therapist

Data collection and analysis
  • MIDI
  • Interaction logs

Management of therapeutic sessions

Ease of use
Wiimote
- 3 accelerometers
- IR sensor
- Buttons and stick

Sound synthesis
- MIDI
- XV-2020, software synthesizer
- Hi-Fi stereo system

Software
- Glovepie
- Cubase, Reaper
System Design

Goals

• Intuitive
• Robust
• Rich (exploration)

UI

• 2 Wiimotes per patient
• Percussion-like triggering (5 volume levels)
• Instrument change (+, -)
• Sound selection (Ø, A, B, D-pad)

Sounds

• 3 instruments: Congas/Djembe, Cymbals, Marimba
• 4 timbres per instrument
Participants

- Children from 6 to 11 with behavioural disorders (after-school mental health hospital)
- E. Lecourt (Paris V): *Sonorous Communication*
- R. Michel (Paris V): design, treatment
- P. Jouvelot (CRI): design
- S. Benveniste (CRI): design, implementation

Protocol

- 4 groups of 2 or 3 children under treatment with MT
- Welcome, explanation
- 1 SC session per group
Results (1)

Cultural and motivational aspects

• Increased self-esteem
  “What can we change?”, “Remove this button”, “I'm like a real musician on TV”

• Appealing technology
  “Whoa, the Wii!”, “It's magic!”, “Thanks for the Wii”

• New capabilities
  “There are several musics (sic)”, “Call it the Catalogue”, “Where's my derbuka?”

Usability

• Difficult navigation

• Intuitive triggering

• Added freedom (dancing, system “tricking”)
  “Here, I'm doing it with the wrist”
Individual psychodynamical aspects
• No violent acting-out
• Lack of corporality has no impact
• Symbolization and representation enabling
  “It sounds like it's running”, “I'm playing like a beating heart”

Group psychodynamical aspects
• Easily shared common pulse
• Collaborative exploration
  “You changed the volume”, “You're playing too loud!”
  “Look at me; you can do it like this”
• Identification
  “That's me!”
Future Work

Sound space exploration
• One year with the same children (~10)
• Same UI, new sounds (sampled or purely synthetic)
• Sonorous History map

Design space analysis
• E. Lecourt's M.S. MT students (~10)
• New instrument controls (based on real ones or not)
• Language, guidelines and tools for instrument design

Data analysis
• Control group (“normal” children)
• Collected MIDI data (MTTB, Beatroot)
• Movements (silent play)
Conclusion

MAWii System for music therapy

Proof-of-concept experiment in a day-care mental health hospital
  • Robust design and implementation
  • Good acceptance by patients
  • Promising signs of therapeutic value

Therapeutic impacts of patient-centric digital instrument design using video game technology