

CONTRIBUTIONS TO THE USE OF VIRTUAL AGENTS TO STIMULATE SOCIAL INTERACTION IN CHILDREN WITH AUTISM SPECTRUM DISORDER

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Motivation of the work

- Information and Communication Technologies (ICT) have made great contributions in promoting the inclusion of people with disabilities.
- Autism Spectrum Disorder (ASD) has received lots of attention recently, and there exist technological aids for detection, diagnosis and treatment.
- Recent advances in enabling areas of audio and video recognition, processing and synthesis have led to new proposals on how to stimulate social interaction in children with ASD.

Thesis Objectives

- > To design and implement a system to enhance the social skills of children with autism through interaction with Virtual Agents.
- > To implement Virtual Agents controlled by people and combined with artificial intelligence.
- To promote interaction through a mediating expert system, grounded on knowledge models of the ASD domain.
- > To automate a screening tool that allows the constant monitoring of children with ASD.

Research Plan

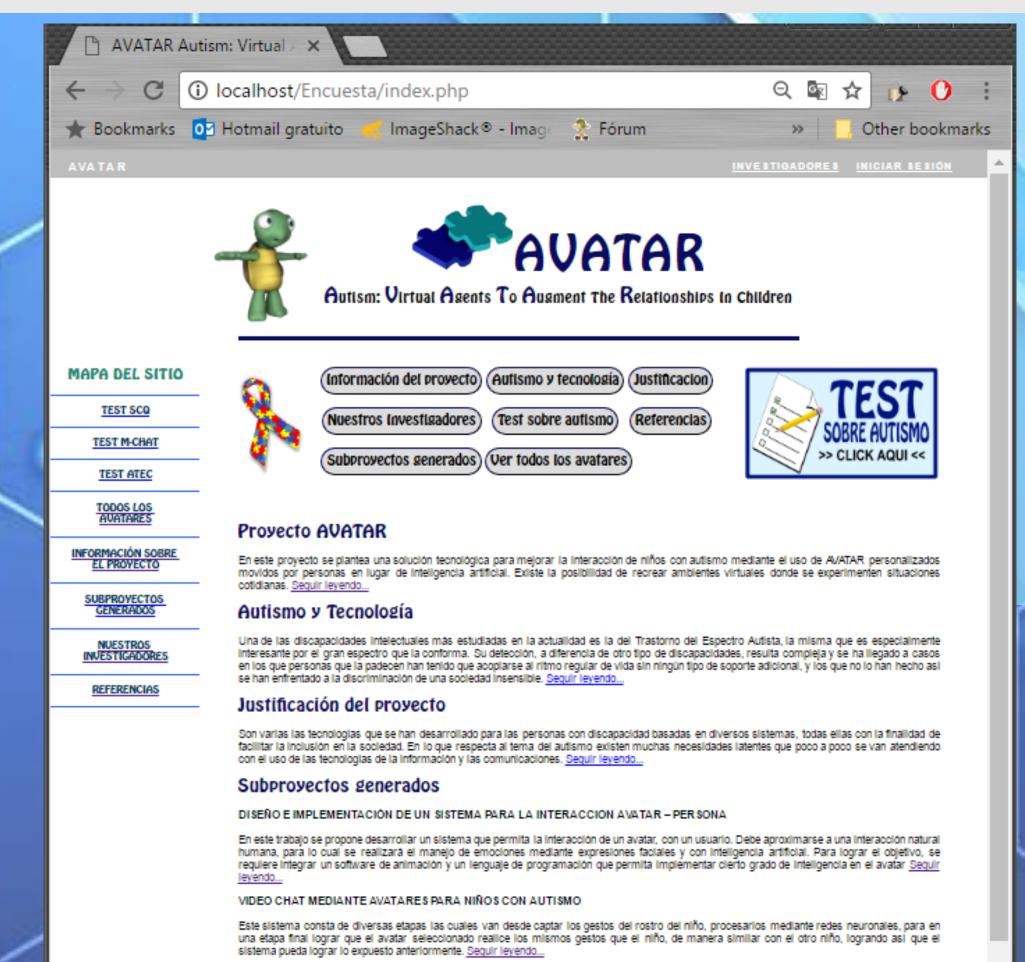
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		uration	9 12	1	9	9 10 1	2 1	2	8	9 12	1 2	2 3	10	11 1	2 1		4 5		8 9	12	1	3
	1 Study of state of the art and analysis of screening tools	12																				
ì	2 Automation of screening test to monitoring the progress of children	4																				
- ;	3 Design of interaction system: Virtual Agent - Person	13																				
	4 System Implementation	14																				
	5 In-field testing in collaborating institutions	6																				
	6 Analysis of results	4																				
1	7 Thesis report	7																				
,	8 Publication of results	38																				

Results & Discussions

- * We have got funding from Universidad Politécnica Salesiana for a project titled "AVATAR: Autism Virtual Agent To Augment Relationships in children". Two lines of research and development have been launched: "Videochat using Virtual Agents for children with ASD" and "Design and implementation of a system for Avatar-Person interaction".
 - Both lines are currently in the stage of information gathering and design.
 - Controlled experiments will be conducted at the CIMA school for children with ASD in Cuenca, Ecuador.
 - √ 40 children will be involved.
- ✓ A web page is being created for the application of screening tests for diagnosis and monitoring.
- * The PhD thesis proposal was accepted for discussion in the Joint International Summer School Bioinnova 2017, Emerging Technologies to Support Healthcare and Independent Living, aimed at PhD students to present their research ideas and get feedback from a panel of experts.
- A paper titled "AVATAR: Autism Virtual Agents To Augment Relationships in Children" has been submitted to INTERCON 2017 conference.

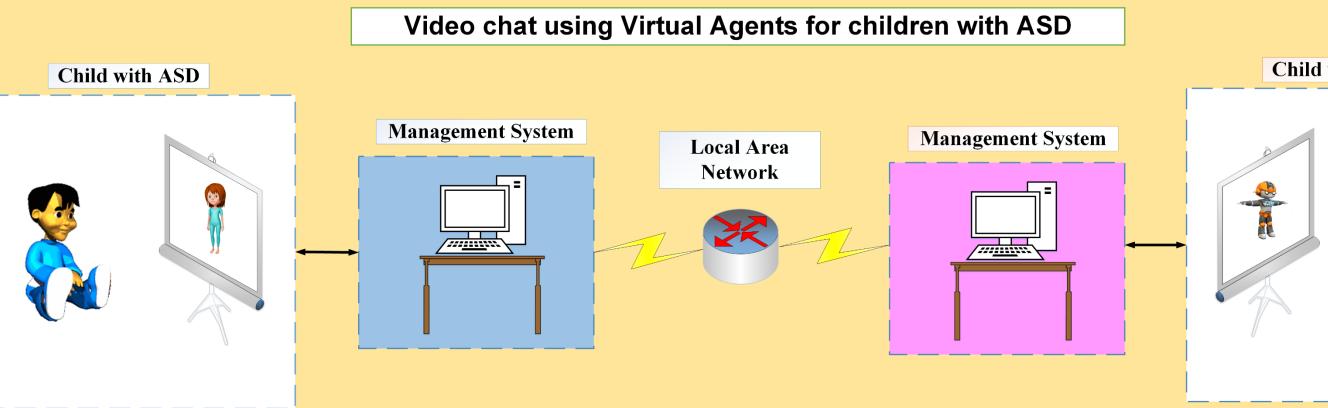
Design and implementation of a system for interaction Avatar – Person **Interaction Environment** Expert System Person Interface

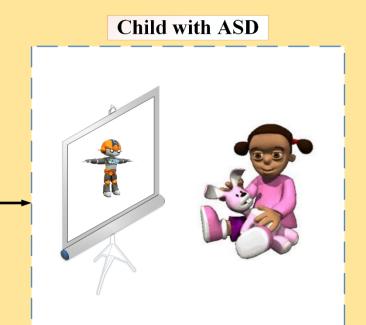
- A prototype system for Avatar-Patient interaction, with a
- mediating expert system in place to apply selected routines, in which the child learns by imitation.
- The system is reasonably responsive and there is logic and continuity with the conversation.
- Off-the-shelf audio and video recognition.



The main purpose of web screening test and get the test results immediately. It provides important information shows project and avatars available.







- An early prototype aiming to promote interaction between two children affected by ASD.
- Each child interacts with an avatar controller by the other.
- In the past, experiments with robots in the place of the avatar attained promising results.

Next Year Planning

- Design of Virtual Agents characteristics using the results of first screening test (Social Communication Questionnaire).
- Design of interaction system: Virtual Agent Person.
- Acceptance testing of Virtual Agents in controlled experiments with collaborating institutions.

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