ILHAIRE
INCORPORATING LAUGHTER INTO HUMAN-AVATAR INTERACTIONS: RESEARCH AND EVALUATION

eNTERFACE 2012 project proposal

LAUGH MACHINE

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Abstract: Laughter is a significant feature of human communication, and machines acting in roles like companions or tutors should not be blind to it. So far limited progress has been made towards allowing computer-based applications to deal with laughter. In the LAUGH MACHINE project, we will endow a virtual agent with the capability to laugh along with a user.

The project will cover two axes. First, an agent will be developed that is able to laugh appropriately (i.e., right time, right intensity) when interacting with a user. This architecture will be a step towards an agent able to perceive the human behaviours, interpret them, but also to synthesize audio-visual believable laughter, choose an appropriate laughter or adapt its laughing behaviour to the user as well as express its own intentions with laughter (e.g., by using social laughter).

Second, the use of such an agent to support psychological studies that measure the possible benefits of laughter and that improve or make more natural person-machine interaction. This entails identifying important features that increase the positive perception of the agent by everyone; avoiding malicious or malevolent laughs and paying attention to the "uncanny valley".

For this purpose, we will focus on one interactive scenario where our laughing agent will be used. In the scenario currently considered, the user would watch a funny stimulus (i.e., film clip, cartoon) together with the virtual agent. The agent should be able to laugh, reacting to both, the stimulus and the user's behaviour. The impact of the agent will be assessed through user evaluation questionnaires (e.g., assessing the mood pre and post experiments, funniness and aversiveness ratings to both stimuli and agent behaviour, etc.). Different avatar "personalities" (in respect to laughter behaviour) could also be investigated.

1. Project's objectives

Laughter is a significant feature of human communication, and machines acting in roles like companions or tutors should not be blind to it. In LAUGH MACHINE, we aim to increase the communicative repertoire of virtual agents by giving them the possibility to laugh naturally (i. e., expressing different types of laugh according to the context).

To achieve this, we will need analysis components that can detect particular events (some can be pre-defined as the stimulus will be known in advance) as well as interpreters that will decide how the virtual agent should react to them. In some cases, the virtual agent will be instructed to laugh in a certain way, which will require other components, able to synthesize audio-visual laughs.

The members of the ILHAIRE[1] consortium will provide the core components of the system. Other LAUGH MACHINE project members may provide additional components that will be integrated during the workshop. The work during the eNTERFACE'12 LAUGH MACHINE project will focus on 1) integrating these core components together to form a full processing chain (from multimodal event analysis to audio-visual laughter synthesis); and 2) evaluating the system and bringing knowledge on particular issues that interactions with a laughing agent might create.

This last aspect is extremely important. In addition to measuring the possible benefits of such an avatar, user evaluations will be used in support to designing improved or more natural person-machine interaction. The goals will be to identify important features, to make sure that the agent's laughs are not misperceived by the user (e.g., malicious or malevolent laughs) and paying attention to the "uncanny valley": the discomfort caused by an automated agent that reproduces very closely, but imperfectly (e.g. bad timing, disproportionate response), human behaviours.

In consequence, besides the technical considerations required to build a virtual agent capable of generating believable audio-visual laughs, particular attention will be given to designing an interactive scenario that will provide us with the best system evaluation possible. The design should allow for comparing different variations of social settings of interaction and agent behaviour patterns. Conditions will be designed on a continuum of laughter elicitation.

The LAUGH MACHINE project will deliver a full processing chain to have an agent laughing appropriately when interacting with a user, as well as deep scientific insights about integrating laughter to avatars, when and how should they laugh, what challenges arise from a psychological perspective, etc.

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[1] ILHAIRE is a European FP7 project aiming to incorporate laughter in human-agent interactions. It started in September 2011 and will last 3 years. It gathers experts on the psychology of laughter, database collection, multimodal signal acquisition, signal processing, processing of emotions, motion analysis, animation of virtual agents, etc. More information on www.ilhaire.eu

2. Background information

The audio-visual synthesis of laughter requires the development of innovative hybrid approaches that combine several existing animation techniques such as data-driven animation, procedural animation and machine learning based animation. Some preliminary audio-driven models of laughter have been proposed. In particular Di Lorenzo et al. (2008) proposed an anatomic model of torso respiration during laughter, while Cosker and Edge (2009) worked on facial animation during laughter. The first model does not work in real-time while the second is limited to only facial animation. Interactive systems using laughing virtual agents are even less frequent.

Urbain et al. (2010) have proposed the AVLaughterCycle machine, a system able to detect and respond to human laughs in real time. With the aim of creating an engaging interaction loop between a human and the agent they built a system capable of recording the user's laugh and responding to it with a similar laugh. The virtual agent response is automatically chosen from an audio-visual laughter database by analysing acoustic similarities with the input laughter. This database is composed of audio samples accompanied by the motion capture data of facial expressions. While the audio content is directly replayed the corresponding motion capture data are retargeted to the virtual model.

Shahid et al. (2009) proposed Adaptive Affective Mirror, a tool that is able to detect the user's laughter and to present audio-visual affective feedback, which may elicit more positive emotions in the user. In more details, Adaptive Affective Mirror produces a distortion of the audio-visual input using real-time graphical filters such as bump distortion. These distortions are driven by the amount and type of user's laughter that has been detected. Fukushima et al. (2010) built a system able to increase users' laughter reactions. It is composed of a set of toy robots that shake heads and play preregistered laughter sounds when the system detects the initial user laughter. The evaluation study showed that the system enhances the users' laughing activity (i.e., generate the effect of contagion).

Finally, Becker-Asano et al. (2009) studied the impact of auditory and behavioural signals of laughter in different social robots. They discovered that the social effect of laughter depends on the situational context including the type of task executed by the robot, verbal and nonverbal behaviours (other than laughing) that accompany the laughing act (Becker-Asano and Ishiguro, 2009). They also postulate that intercultural differences exist in the perception of naturalness of laughing humanoids (Becker-Asano et al., 2009).

In this project we plan to use the SEMAINE architecture (Schroder, 2010), which is a distributed framework for real-time interactive agent-based systems. It can process different types of user data, such as facial expressions, speech, etc. It can also infer about the user's state and generate the agent's behaviour both while it speaks and listens. It is composed of a set of feature extractors, analysers and interpreters that continuously communicate with the SAIBA (Vilhjalmsson et al., 2007) compliant agent though a whiteboard message exchange system. It has been integrated with the Greta agent (Niewiadomski et al., 2011).

Regarding the acoustic synthesis of laughter, literature is extremely limited. There is work by Lasarcyk and Trouvain (2007), as well as Sundaram and Narayanan (2007), but their synthesized laughs were not perceived natural by naïve users. To improve its naturalness, we are planning to synthesize acoustic laughter by using statistical parametric synthesis, an efficient technique for speech synthesis (Tokuda et al., 2002).

3. Detailed technical description (max 3 pages)

a. Technical description

The LAUGH MACHINE project will cover two axes: 1) the integration of audio-visual context analysis and laughter synthesis components to build a context-aware laughing agent architecture; 2) its application to study the impact of the interaction with a laughing agent for the user. These two axes will influence each other: psychological experiments will depend on the technology used to control the agent; and on the other hand the results of user evaluations and psychological studies will help to improve our laughing agent by identifying different sources of flaws (e.g., failure to interact, features of the laughter).

In this section we will first briefly present the different core components that will be integrated in our interactive laughing agent architecture. Then we will present the scenario for user evaluation and psychological experiments.

i. Integration of core components to build a laughing avatar

The required core components are: context analysis from audio and visual modalities, dialog manager (to decide when and how the avatar must react) and audio-visual laughter synthesis (i.e., an avatar endowed with the capability to utter laughs, by outputting an audio file synchronized with its facial and body movements). Each component will work in real time. The ILHAIRE project partners should provide preliminary versions of each of these components. In addition to the integration task, certain components will be improved and adapted to the scenario during the eNTERFACE workshop. The different components are briefly presented below.

Audio-visual context analysis

The role of this module will be to detect the context the avatar is evolving in. In our scenario, some contextual information will be directly determined by the known stimulus (e.g. punch lines in the film clips presented to the user), but this component should also be able to detect user's responses and behaviours. The SEMAINE architecture will be useful to perform this task, extracting audio-visual features that characterize user's behaviours.

Dialog manager

This component manages the agent's reactions. Taking into account the detected events, this module must decide what the appropriate answer of the avatar is. In case laughter should be produced, this module will also provide some high level description of the laugh (e.g., type and intensity). The dialog manager will be firstly designed in ILHAIRE project: databases will be analysed and particular reinforcement techniques will be used to generalize to situations that have not been encountered in the databases. During eNTERFACE, this component will be integrated with the other components and will be tuned according to the experimental scenario of LAUGH MACHINE.

Laughing virtual agent

This component will display the appropriate responses. The agent involved in the interaction can either speak or laugh, following the instructions given by the dialog manager. This module faces several challenges. First, audio laughter synthesis is an open challenge. Second, visual laughter synthesis is also tricky: even though satisfying results were obtained from retargeting motion capture data in the AVLaughterCycle project (Urbain et al., 2010), actually building models that reproduce the subtle and coordinated movements of laughter in a natural way is complex. Third, the audio and visual synthesis must be accurately synchronized. We are planning to drive the audio and visual synthesis with the same features (opening of the mouth, intensity, etc.), to ensure this tight synchronization. Fourth, while the dialog manager will produce high-level instructions, a generation module will be needed to generate from them the trajectories of the low-level features of the synthesized laughs. Finally, it would be good if some parameters of the synthesized laughs could be easily controlled, as it would increase the range of features that can be evaluated through user studies.

The ILHAIRE Consortium will provide the virtual agent(s) and audio synthesis modules.

"Personality" of laughing virtual agent

Humans have a personality; i.e., a characteristic set of traits whose combination makes individuals unique. A personality trait is conceptualized as a dimension ranging from, for example, low to high anxiety. Traits are dispositions for behaviours, not the behaviour itself. Different personality models differ with respect to the number of basic independent personality traits. The model by Eysenck (Eysenck & Eysenck, 1985) foresees three "super factors", namely introversion vs. extraversion, emotional stability vs. neuroticism (emotionality) and impulse control vs. psychoticism (impulsivity). An alternative model distinguished five dimensions, namely neuroticism, extraversion, openness to experience, agreeableness (vs. antagonism) & conscientiousness. An individual can for example be introvert (e.g., likes playing computer games on their own), emotionally stable (e.g., not easily upset) and high on impulse control (e.g., reflective).

Some of the personality variables affect parameters of laughter. Extraversion is a predictor of positive affect in general and of laughter in particular (Ruch, 2005). Compared to introverts, extraverts are more active, sociable, talkative, venturesome, warm, assertive, lively, carefree, dominant, optimistic, etc. In terms of laughter, extraverts will laugh more easily and at less funny stimuli, louder, with steeper onset, more intense, longer, and more uninhibited, compared to their introvert counterparts.. Introverts will more often smile than laugh, generally do so less frequent, intense etc. Thus, laughter magnitude should be proportional to the general level of extraversion. Further, cheerfulness as a temperament trait predicts laughter parameters even better than extraversion (Ruch & Hofmann, 2012; Ruch, 2005). Neurotics will have more nervous or hysteric laughs, non-agreeable people (like the Spike character in SEMAINE) will more often laugh derogatory and laugh at cruel things. Conscientious people will have more controlled laughter; i.e., rules when to laugh, in what intensity, and with whom. If avatars represent different personality prototypes (rather than being an "average" person), as it was the case in the SEMAINE project (McRorie et al., 2011), the type of laughter they display should match certain personality stereotypes. More precisely, one could vary the level of positive affect of the avatar; i.e., from more introverted ones who laugh less, shorter, at lower intensity, with less facial expressions and less body movements to extravert ones with for example higher frequency, intensity, duration of laughter. Other personalities might be fleshed out as well, but extraversion (or cheerfulness) is the major predictor of laughter.

ii. Scenarios, user evaluation and experiments

Design

The evaluation experiments would involve an agent watching a funny stimulus with a single user, alone in a room. The agent level of interaction will be varied and we will investigate whether this variation influences the participant's behaviour, with the help of questionnaires (mood ratings pre and post the session, funniness and averseness ratings of the film, the liking of the agent, etc.).

We assume a continuum of interaction with the agent (see Table 1), ranging from 1) none (there is no agent and the person is alone in the room) to 2) an agent present, (an agent that is humourless and does not laugh, but the person knows it is functioning) 3) an agent that expresses amusement verbally, but does not laugh, 4) an agent who laughs at predetermined times (or random), independently from the user 5) a pre-recorded human who laughs at equivalent predetermined times to the agent in 4, and 6) an agent reacting to the participant's behaviour.

Table 1: Variations of the avatar's level of interaction

Condition	Description	Theories to consider
Alone	Participants watch the funny film clip alone in a room	Fridlund (1991): solidarity hypothesis
Present agent, humourless	Agent is there, but does not do much (but it needs to be clear that the agent is functioning)	Mere presence hypothesis (although the term must not be used here, as mere presence refers to same species companions)
Present agent, verbal amusement	Agent expresses amusement verbally at pre-determined times, but does not laugh (e.g., says "this is funny" at pre-determined time points, maybe the same time points that are used for the fixed laughter condition)	
Fixed laughter	Agent laughs at pre-determined occasions (certain punch lines in the film→ timing important) no matter what the participant does	
Fixed laughter (pre-recorded human laughter)	Agent laughs at pre-determined occasions (certain punch lines in the film→ timing important) no matter what the participant does	
User aware agent	Agent responds to participant's reactions and laughs accordingly	Emotional contagion and mimicry (Bourgeois & Hess, 2008; Chartrand & Bargh, 1999; Estow et al., 2007; Hatfield, 1992; Iaconini et al., 2009; Lanzetta & Englis, 1989; La France et al., 2000)

Procedure

The experiment will follow a standardized procedure, which will be described in detail and distributed to all experimenters in advance. An outline is in the Appendix A.

b. Resources needed

No particular resources are needed, apart from a quiet, isolated room and a screen for experiments.

4. Work plan and implementation schedule

The work packages would be the following:

- WP1: improvement, integration and synchronisation of the core components, provided by ILHAIRE partners and possibly by other participants
- WP2: evaluation: scenario(s) and experimental design (including questionnaires)
- WP3: application design: setting up the scenarios defined in WP2, recording the experimental data; and, possibly, porting a (simplified) version of the application to a Smartphone or Tablet (computational power limitations might require the use of Virtual Network Computing to achieve this porting).
- WP4: analysis of the experiments and user evaluation
- WP5: reporting/packaging

WP1 would start in week 1 with presentations of the tools available from the different project participants, followed by their integration in a common processing chain.

WP2 and WP3 would start in week 2, so that scenarios can be tested and refined during weeks 2 and 3, according the progress and limitations of the processing chain. Actual recordings with naïve subjects and analysis will take place during week 3 and the first days of week 4.

WP4 would start after the first actual experiment (with a naïve subject), at the end of week 3 and will last until the end of the Workshop.

Week 4 will also be dedicated to WP5: writing the project report and packaging the developed application and modules, so that each project participant will be able to carry on the job if (s)he wants.

The expected deliverables of LAUGH MACHINE are:

a) A full processing chain from multimodal event detection to audio-visual synthesis by an agent,
b) Evaluation of the users' perception of the interaction with a laughing agent, bringing insight on (i) the possible benefits brought by a laughing agent as well as key features to ensure laugh is (ii) convincing (sounding and looking natural) and (iii) positively perceived.
c) Possibly a Smartphone/Tablet application: depending on the profiles of the researchers involved in the project, we could consider porting the application to a Smartphone or Tablet.

5. Benefits of the research

Two main benefits are expected. First of all, we aim at building a truly interactive architecture that will be able to detect and process human behaviours as well as synthesize artificial laughs and display them with the use of a virtual agent. Building it will require the integration of different technologies and research approaches such as signal processing and fusion, dialog system, 3d animation, virtual and mixed reality. The eNTERFACE workshop gives specialists from the different domains the opportunity to work together on such highly interdisciplinary projects.

Second, our architecture will be used as a research tool on the laughter behaviours. During the eNTERFACE workshop we plan to use it to study the impact of a laughing virtual agent on the user's perception in an experimental setting. Thus, we will evaluate the role of agent laughter behaviours during the interaction with humans. The results of this research work will give us feedback on the human responses towards virtual laughter and, more generally, on the purposefulness of building interactive laughing virtual agents. They will also be a step towards building therapeutic tools e.g. for people affected by gelotophobia.

We expect that the same architecture will be used later in research works e.g. on laughter contagion. In addition, we also plan to build an artistic installation on the top of this framework with the aim of studying the emotional and aesthetic impact of an interactive laughter system.

Further benefits are the collection of "laugh" samples from a variety of people, under different but natural conditions and including the range from a slight and barely visible smile, to chuckle and laughter. No one will be instructed to laugh, or amplify laughter, but the natural responses (of a broad variety) will be assessed. The relation between different channels (respiration, acoustics, face) and verbal data (experience of the emotion or quality of laugh) will be studied on the basis of the above mentioned laugh samples. Features might be person-specific (i.e., an Individuals "signature" laugh) or stimulus specific (i.e., some scenes are funnier than others).

6. Profile of the team

a. Project leaders

Jérôme Urbain – PhD researcher at the University of Mons, Belgium

Jérôme Urbain graduated as an electrical engineer from the Faculté Polytechnique de Mons (FPMs), Belgium, in 2006. He then joined the Signal Processing and Circuit Theory (TCTS) Lab of the same University, where he carried works on sleep analysis, speech recognition, and is currently focusing his PhD research works on the acoustic aspects of laughter modelling, synthesis and recognition.

Radosław Niewiadomski – Postdoc researcher at Telecom ParisTech, France

Radosław Niewiadomski received the PhD degree in Computer Science in 2007 from the Universita degli Studi di Perugia, Italy. Currently he is a post-doc at the Telecom ParisTech. His research interests include embodied conversational agents, recognition and synthesis of emotions, interactive multimodal systems.

Jenny Hofmann - PhD researcher at the University of Zurich, Switzerland

Jenny Hofmann is a PhD candidate at the University of Zurich. She received a M.Sc. degree in psychology from Zurich. She studied the phenomenon of "laughing at oneself" experimentally and more recently the fear of being laughed at (i.e., gelotophobia), in a project founded by the Swiss National Foundation (SNF). She is a certified and experienced coder of the Facial Action Coding System (FACS).

b. Staff proposed by the leader

Thierry Dutoit – Full Professor at the University of Mons (Belgium)

Thierry Dutoit graduated as an electrical engineer and Ph.D. in 1988 and 1993 from the Faculté Polytechnique de Mons (now UMONS), Belgium, where he teaches Circuit Theory, Signal Processing, and Speech Processing. In 1995, he initiated the MBROLA project for free multilingual speech synthesis. Between 1996 and 1998, he spent 16 months at AT&T-Bell Labs, in Murray Hill (NJ) and Florham Park (NJ). He is the author of several books on Speech Synthesis and Applied Signal Processing, and he wrote or co wrote more than 20 journal papers, and more than 120 papers on speech processing, biomedical signal processing, and digital art technology. He has been an Associate Editor of the IEEE Transactions on Speech and Audio Processing (2003-2006) and the president of ISCA's SynSIG interest group on speech synthesis, from 2007 to 2010. In 2005, he initiated the eNTERFACE 4-weeks summer workshops on Multimodal Interfaces and was the organizer eNTERFACE'05 in Mons, Belgium. He was also part of the organizing committee of INTERSPEECH'07 in Antwerpen. T. Dutoit is a member of the IEEE Signal Processing and Biomedical Engineering societies, and is part of the Speech and Language Technical Committee of the IEEE since 2009. He is involved in collaborations between UMONS and ACAPELA-GROUP, a European company specialized in TTS products. Recently he founded the NUMEDIART Institute for Media Art Technology, of which he is the director.

Maurizio Mancini – Postdoc researcher at the University of Genoa (Italy)

Maurizio Mancini received his PhD in Computer Science at University of Paris 8 (France) in 2008, working on expressive embodied conversational agents. Then he joined the InfoMus Lab at University of Genoa (Italy) as a post-doctoral researcher at the end of 2008. He currently works on the analysis of expressive gesture in human movement and he is still collaborating with researchers from other universities on expressive avatars.

Tracey Platt – PhD researcher at the University of Zurich, Switzerland

Tracey Platt is a PhD candidate at the University of Zurich. She received a M.Sc. degree in occupational psychology from Hull University, UK. She studied ridicule and teasing in relation to the fear of being laughed at (i.e., gelotophobia). Further research in gelotophobia involves different perspectives (emotions, cultural differences, aged populations, stutterers), partly in a project founded by the Swiss National Foundation (SNF). She is a certified FACS-coder.

Florian Lingenfelser – PhD researcher at the University of Augsburg, Germany

Florian Lingenfelser received his M.Sc. degree in Informatics and Multimedia from the University of Augsburg, Germany, in 2009. In 2010 he joined the chair for Human Centered Multimedia of the same University as PhD student. He is currently contributing to multimodal data fusion within the CEEDS project and developing the Social Signal Interpretation (SSI) framework.

Johannes Wagner – PhD researcher at the University of Augsburg, Germany

Johannes Wagner graduated as a Master of Science in Informatics and Multimedia from the University of Augsburg, Germany, in 2007. Afterwards he joined the chair for Human Centered Multimedia of the same University. Among other projects, he is currently infolved in the European projects CEEDs and ILHAIRE. He is the core developer of the Social Signal Interpretation (SSI) toolkit, a general framework for real-time recognition of non-verbal behaviour in a multimodal approach.

Willibald Ruch – Professor for Personality Psychology and Assessment at the University of Zurich, Switzerland

Willibald Ruch is psychologist by training and full Professor of Personality Psychology and Assessment at the University of Zurich. He has worked on the expressive pattern of laughter, exhilaration and humour since 1978. He is specialized in conducting experiments on humour and laughter and has designed several questionnaire measurements on humour- related traits. He is the president of the International Society for Humour Studies (ISHS) and runs the International Summer School on Humour and Laughter Theory Research and Application.

Gary McKeown – Senior researcher at the Queen's University Belfast (UK)

Gary McKeown is a cognitive psychologist at the School of Psychology, Queen's University Belfast. He received his BA and PhD at QUB, his doctoral thesis concerned implicit learning in the control of complex systems. His research focuses on communication, with interest in risk perception and decision making in environmental and health settings. This led to an interest in emotion and in particular the interrelationship of cognition and emotion. Recent research has focused on emotion, social signal processing and the cross-cultural emotion perception, most recently the SEMAINE project on emotion-sensitive avatars, where he has been responsible for recording large-scale data collections.

Nadia Berthouze – Senior Lecturer at the University College London (UK)

Nadia Berthouze is currently a Senior Lecturer in the UCL Interaction Centre (UCLIC) at the University College London. Her main expertise is the study of body movement in affective computing, and how it affects the design of systems for providing their users with a rich and positive affective experience. Her current research focuses on studying body movement as a medium to induce, recognize, and measure the quality of experience of humans interacting and engaging with/through whole-body technology. She is also investigating the various factors that affect such experience, including emotional contagion and cross-cultural differences.

Harry Griffin – Postdoc researcher at the University College London (UK)

Harry Griffin received his PhD in Psychology from the University of Cambridge (UK). His area of expertise is visual perception. He has worked on a BBSRC funded project on the perception of dynamic faces. He proposed a method to generate an effective average photorealistic avatar onto which people's facial movements are mapped. His current research focuses on the perception of laughter from body movement and the factors that may affect the emotional contagion of laughter.

c. Other researchers needed

Even if the LAUGH MACHINE project is related to the ILHAIRE project, we encourage researchers not involved in ILHAIRE to participate in this work. We are particularly looking for experts in the following domains:

i. Data streams in the network and/or Smartphone application design

The application design requires the simultaneous display of a stimulus and an agent on a screen, as well as the capture of audio-visual data during the experiment. An expert in network communication and design of interactive (driven by network signals) web application would be helpful to manage the information streams. Also, we would have the possibility to port the laughing agent application to a Smartphone or Tablet if we are joined by an expert in the domain.

ii. Mixed reality (AR, holograms)

The believability of the agent will depend on its display as well as its attitude and communicative capabilities. It could be interesting to integrate the agent in a virtual environment. A specialist in augmented reality, 3D display (or holograms) would allow exploring these dimensions and increasing the impact of the application.

iii. Physiological sensors and processing of physiological signals

Physiological sensors could be used during the experiments, to measure signals like respiration and heart rate, finger pulse pressure, etc. and analyse their evolution during the experiments. Such signals could also serve as input for inferring the user state and drive the dialog manager. A researcher with expertise on this type of data recording and processing physiological signals would be helpful for these developments.

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APPENDIX A: Gross outline of the experimental procedure

The participant will be randomly assigned to one condition. Then, the experimenter will introduce the setting and give the instructions to the following session. The participant will be asked to fill mood and personality questionnaires and general questions on the liking of the funny film/character and avatars and will then be left alone in the room to watch the film. After the film, the experimenter will enter the room again and give the participant the mood inventory, as well as the questions concerning the perception of the film and the agent. Once the participant has completed all questions, the experimenter will debrief the participant and ask for permission to use the obtained data. First experiments will be carried out during eNTERFACE to evaluate the system. To obtain statistically significant results, we will however need around 20 subjects per condition, so the experiments will be carried on also after the workshop.