1 Publishable Summary

1.1 Project Objectives

The ability to understand and manage social signals of a person we are communicating with is the core of social intelligence. Social intelligence is a facet of human intelligence that has been argued to be indispensable and perhaps the most important for success in life. Although each one of us understands the importance of social signals in everyday life situations, and in spite of recent advances in machine analysis and synthesis of relevant behavioural cues like blinks, smiles, crossed arms, head nods, laughter, etc., the research efforts in machine analysis and synthesis of human social signals like empathy, politeness, and (dis)agreement, are few and tentative. The main reasons for this are the absence of a research agenda and the lack of suitable resources for experimentation.

The mission of the SSPNet is to create a sufficient momentum by integrating an existing large amount of knowledge and available resources in Social Signal Processing (SSP) research domains including cognitive modelling, machine understanding, and synthesizing social behaviour, and so:

- enable creation of the European and world research agenda in SSP,
- provide efficient and effective access to SSP-relevant tools and data repositories to the research community within and beyond the SSPNet, and
- further develop complementary and multidisciplinary expertise necessary for pushing forward the cutting edge of the research in SSP.

The collective SSPNet research effort will be directed towards integration of existing SSP theories and technologies, and towards identification and exploration of potentials and limitations in SSP. More specifically, the framework of the SSPNet will revolve around two research foci selected for their primacy and significance: Human-Human Interaction (HHI) and Human-Computer Interaction (HCI). A particular scientific challenge that binds the SSPNet partners is the synergetic combination of human-human interaction models, and automated tools for human behaviour sensing and synthesis, within socially-adept multimodal interfaces.

1.2 Work Performed and Main Results

The SSPNet has exploited three avenues to achieve its objectives:

- The first avenue is the web portal (`www.sspnet.eu`), online since August 1^{st} 2009, that has welcomed more than 2,000 visitors from all over the world and is the main SSPNet instrument towards efficient and effective access to SSP-relevant tools, data and knowledge both within and beyond the SSPNet. It includes a repository of benchmarks and datasets annotated in terms of social signals (240 hours of recordings), a repository of software tools (6 packages addressing different SSP related needs), and

an extensive bibliography (more than 300 papers including the publications of the SSPNet). All repositories welcome contributions from both within and beyond the SSPNet and are expected to grow as the SSPNet continues.

- The second avenue is the organization of training (schools, courses, etc.) and scientific (workshops, special sessions, etc.) events gathering researchers from both the SSPNet and the rest of the scientific community. After two workshops one course and one Doctoral Consortium in 2009, the SSPNet has setup a rich plan of events for 2010 (see `www.sspnet.eu`). Overall, the events organized during 2009 have involved more than 120 persons and they continue to attract attention in the Virtual Learning Centre hosted on the SSPNet portal. Here is where the lecture and presentation recordings collected during the events have been posted and watched by more than 950 persons in the few months following the Virtual Learning Centre opening.

- The third avenue is the publication of high quality works in the most important journals and conferences. During 2009, the SSPNet researchers have published 7 journal papers, 14 conference papers, 4 book chapters and one edited book covering all of the most important aspects of Social Signal Processing, including the extraction of nonverbal behavioral cues (facial expressions, prosody, gestures, etc.), the synthesis of social behavior (politness, social emotions, etc.), the modeling of social interactions (nonverbal communication, foundations of social signals, etc.) and the automatic understanding of social phenomena (roles, agreement and disagreement, subjectivity, etc.).

1.3 Expected final results and their potential impact

The ultimate goal of the SSPNet is to provide the scientific community with means and resources allowing any institute, group or researcher to enter a domain like Social Signal Processing that requires multiple competences spanning across different disciplines. Thus, the result expected at the end of the SSPNet is a significant lowering, if not the elimination, of the main entry barriers to SSP:

- *The knowledge barrier.* The extensive bibliography available on the SSPNet portal and the presentation recordings collected in the Virtual Learning Centre provide an exhaustive and up-to-date view of the SSP state-of-the-art. Furthermore, training and scientific events organized with continuity by SSPNet researchers allow any interested person to access first hand knowledge about the most recent developments in SSP. Last, but not least the SSPNet elaborates the SSP research agenda, the document highlighting the most important issues and challenges in SSP. On the long-term, the combination of these resources and activities will progressively eliminate the knowledge barrier.

- *The data barrier.* The large, and constantly growing amount of annotated data available on the SSPNet portal (see previous section) allows any interested researchers

not only to perform experiments in SSP, but also to compare the results with those obtained by other researchers contributing to the SSP state-of-the-art. As annotated data is one of the most expensive and time consuming resources, to provide benchmarks and databases contributes to eliminate one of the most important entry barriers to the domain.

- *The tool barrier.* Social Signal Processing requires competences in multiple domains including analysis, synthesis and modeling of voice, facial expressions, gestures, gaze, etc. This makes it difficult for groups, and even more for individual researchers, to have at disposition all instruments needed to perform experiments in SSP. The tool repository available on the SSPNet portal (see previous section) aims at eliminating such a barrier.