

Project Co-ordinator Details

Dr Nick Lodge, E-mail: nick.lodge@itc.org.uk,
Tel: +44 1962 848634
Fax: +44 1962 886109
Address: ITC, Kings Worthy Court,
Kings Worthy, Winchester,
Hants SO23 7QA, UK.

Executive Summary

- Development of the Broadcast Transmission system has continued, with hardware work and experiments that transfer data from a server PC to a visualiser PC, using a one-way UDP data connection that mimics a broadcast link. Very successful work has demonstrated high compression of the data stream for test sequences.
- An Alpha-release version of an ActiveX animated signing visualiser has been developed and distributed to Partners. A prototype for the WWW browser plugin has been developed using the ActiveX visualiser.
- Motion capture sessions have taken place to record signs for Weather Reports in both SLN and DGS. Partners have been trained in editing sign sequences for future visualisation and editing is in progress at partner sites.
- Deliverable D3-1 (“Constrained PO System”) has been completed and evaluated by the RNID. The face to face transaction system has been modified in accordance with the evaluation report, which confirmed the planned direction of further work. A proposed product development plan, including estimated costs has been completed.
- The new avatar for use in the project, “Visia”, has been distributed to all partners. Signs used in the Post Office system can be used, without modification, with Visia.
- *Signing Gesture Markup Language* (SiGML) is the name now agreed by partners to replace GML in the original project proposal.
- An extensive item on ViSiCAST was broadcast on the BBC “See Hear” programme, using an interview with RNID staff. Positive reactions from the deaf community will enable more proactive publicity in future.
- A prototype of the Broadcast Transmission system was presented to the UK Terrestrial Digital Networks committee as a candidate for providing closed-captioned broadcast signing. The ViSiCAST system was very favourably received.

1 – Overview

1.1 Objectives

<i>Objectives</i>	<i>Progress towards achieving objectives</i>
	<p>ViSiCAST will develop, evaluate and apply realistic virtual humans (avatars) to the generation of European deaf sign languages. The gesture description language and the associated real-time virtual humans will be used in the human-computer-interface of many applications.</p> <p>In the Applications Work Packages, ViSiCAST will:</p> <p>1. Enhance the status of Europe's deaf citizens by improving their access to public services and entertainment, and enable them to develop and consume their own multimedia content for communication, leisure and learning. It will build applications for the signing system for:</p>
1.1 Television	<p>WP1: Television and Broadcast Transmission</p> <ul style="list-style-type: none"> • File specifications, formats and examples for a prototype transmission system for D1-1 have been exchanged between TV, IRT, and INT. The system will be based on the Mask-VR file format and will use separate server and visualiser components. After discussion, and exchange of views, software engineering of a system to mimic a broadcast link is nearing completion. • Investigation of the data format by UEA has shown that efficient compression is feasible, leading to a bandwidth comparable with a speech channel. • The system prototype was demonstrated by the project to broadcasters in the UK and was very favourably received. • Work continues at IRT on adapting DSP cards to deliver the broadcast demonstration. The lower layers of the communications software have been developed and tested successfully. IRT and TV are addressing synchronisation and time-stamping issues for broadcast experiments. • An enhanced version of the partial MPEG-4 Video encoder/decoder has been produced by INT, including new features such as high bit-rate coding for high-quality video compression and on-demand decoding scalability. Work in progress will integrate human body geometry and motion compression features within the video encoder. Progress has been made on integration of video object-based motion compression within the existing prototype of MPEG-4 Video encoder. This work contributes to D1-3 TV Specifications. • Future work to convert between Mask-VR and MPEG-4 will be based on the streamed data format used by the broadcast system. Interfaces are being provided to enable efficient manipulation of data in the new format.
1.2 Multimedia and the Internet	<p>WP2: Multimedia and WWW Applications</p> <ul style="list-style-type: none"> • The design specification for the browser plug-in has been finalised by IvD. • The motion components needed for the translation of weather reports into Sign Language of the Netherlands (SLN) have been captured by

	<p>UEA, TV, and IvD using the project motion capture system.</p> <ul style="list-style-type: none"> • The weather forecast model has been translated and adapted to DGS, and a capture session completed by UEA and UH. A Video version of the script has been produced. • Motion data editing software has been distributed by TV to IvD and UH. Final editing of SLN and DGS signs is in progress. • TV has circulated a prototype ActiveX visualiser for animated signing for appraisal by ViSiCAST partners. The visualiser can operate in applications such as Visual Basic and Excel. Continuing work is developing the next generation browser-based display environment for Signing Avatars. • UEA has developed supporting software for D2-1 Browser Plugin demonstrator incorporating the ActiveX visualiser. Milestone M2-1 Initial SiGML Tool has been completed, demonstrating an avatar driven by a subset of SiGML. A tool is under development that will simplify Weather Forecast script generation for the WWW.
<p>1.3 Face-to-face transactions</p>	<p>WP3: Face-to-Face Transactions</p> <ul style="list-style-type: none"> • The Constrained Post Office System (D3-1) has been completed by UEA. A working system has been engineered which combines domain oriented robust speech recognition techniques with simple translation functions and avatar animation. The system was evaluated by the RNID working with UKPO. Feedback from Deaf people whose first language is BSL suggests that specific improvements are desirable to increase acceptability. • Enhancements suggested by evaluation of D3-1 have been addressed and will be incorporated in a new version using an improved avatar, Tessa2, that is compatible with Visia. Costs and risks have been identified by UKPO in order to transform the prototype face-to-face transaction system into a fully supported robust product. A report detailing proposed product development routes will shortly be made available. • Work is progressing on a less constrained recognition system (D3-2). The approach involves techniques for mapping from unconstrained to constrained phrase sets.
<p>In the Research Work Packages, ViSiCAST will:</p>	
<p>2 Develop systems for the generation, storage and transmission of virtual signing. 3 Refine user-friendly methods for capturing signs</p>	<p>WP4: Animation and Modelling</p> <ul style="list-style-type: none"> • Work is in progress at TV to create an advanced run-time environment for the Signing Avatar, with virtual camera and virtual lighting controls. This will permit improved realism and offer the potential for more user choice in the setting of parameters. This environment will become the Avatar run-time host for all three application workpackages. • Continued development of the capture and replay system is taking

	<p>place, overcoming some shortcomings and making the system more straightforward to use, both for capture and editing. UEA is researching the use of Active Appearance Models (AAMs) to provide improved handling of facial gestures for D4-2 Notation Avatar.</p> <ul style="list-style-type: none"> • INT are making progress on D4-4 Advanced MPEG-4 Animation System: Full version of MPEG-4 compliant NewDan model released. MPEG-4 SNHC player version 1 released, allowing (i) full animation (including face and body) of MPEG-4 compliant avatar models; (ii) import of MaskVR parameters to MPEG-4 format. Extensive validation of the import module to be done. • TV supplied full details of the latest avatar, “Visia”, to INT, in a format requested by them, with a view to enabling them to implement comparative tools in MPEG4/SNHC platforms. Changes to the format of MaskVR motion data has led to some delays in the study by INT of the reversibility of TV MaskVR to MPEG-4 motion parameter translation. • Work has started on approaches to M4-5 Initial SiGML Driven Avatar. INT have tools for synthetic animation through MPEG-4. TV have developed an Excel application of the ActiveX visualiser, demonstrating potential of the system as a basis for a synthetic sign creation tool.
<p>4 Create a machine-readable notation to describe sign-language gestures (hand, face and body) which can be used to retrieve stored gestures or to build them from low-level motion components. 5 Use this descriptive language to produce tools that can translate from both speech and text into signing.</p>	<p>WP5: Language and Notation</p> <ul style="list-style-type: none"> • Proposed HamNoSys refinements (draft for M5-3) are under internal evaluation for completion in the next quarter. Potential grammar development tools have been analysed in the light of the special needs of sign language grammar and phonology: members of the project are in contact with the authors of leading tools. • A tool is being developed to convert HamNoSys to SiGML providing access to a large repertoire of transcribed signs. Grammar work is enabling rationalisation of HamNoSys and its SiGML counterpart. • A SiGML processing tool has been developed which processes streamed data conforming to M5-10 Initial SiGML to drive a visualiser within M2-1 SiGML Tool Initial. Work on NL-to-DRS translation software continues (D5-3).
<p>6 Trial and evaluate the Application prototypes</p>	<p>WP6: Trials and Evaluation</p> <ul style="list-style-type: none"> • Recruitment for the Community Evaluation Officer is in progress, but delays have occurred due to a candidate declining the post at a late stage.
<p>7 Ensure effective management, external communications and publicity for the project</p>	<p>WP7: Project Management, External Communications and Publicity</p> <ul style="list-style-type: none"> • The RNID facilitated and took part in a BBC “See Hear” interview about ViSiCAST, broadcast 15th July. The project has therefore ensured that early publicity gave precedence to Deaf people.

8 Ensure appropriate exploitation and dissemination of results

WP8: Exploitation and Dissemination

- Publicity material has been prepared for use at the RNID exhibition in London, the FP5 exhibition in Nice, and for the ViSiCAST Annual Review.
- Televirtual, ITC and UEA co-operated to develop a demonstration of the ViSiCAST project, concentrating on WP1 (Television and Broadcast Transmission). This was presented to the UK Terrestrial Digital Networks Committee, with a view to the adoption of ViSiCAST signing technology for UK broadcast and cable TV. The presentation demonstrated the prototype transmission link developed in WP1, mentioned above.
- An extensive programme of publicity events has taken place, with significantly more planned in the future. These events, arranged by the Post Office, are aimed both at Deaf people and at retailers and service providers who would benefit from the implementation of this technology.
- A presentation about ViSiCAST has been delivered at TISLR, the largest conference of the sign language research community.
- TV completed preparation, with partners of publicity material for use at the Project Annual Review, the RNID exhibition in London and IST exhibition in Nice in November 2000.

1.2 Milestones

<i>Milestone</i>	<i>Planned date</i>	<i>Actual date</i>	<i>Comments</i>
M2-1 Initial SiGML Tool	07.00	07.00	Delivered with an old version of the visualiser but will be updated for the new system for D2-1.
M3-4 Constrained PO System Report	07.00	07.00	Appears in D3-1.
M6-1 Evaluation of Constrained PO System	07.00	07.00	Appears in D3-1.
M4-6 Integration for Broadcast Demo	09.00	08.00	Completed early along with D4-1 for a demonstration to the TDN Committee.

1.3 Deliverables

<i>Deliverable Code & Name</i>	<i>Planned date</i>	<i>Actual date</i>	<i>Comments</i>
D3-1 Constrained Post Office System	07.00	07.00	System constructed and evaluated by WP6. Documentation delayed to include academic paper analysing the evaluation results.
D4-1 Prototype Anim System Direct Transmission	09.00	08.00	The first implementation is in a sufficiently advanced state that it could be demonstrated to an independent panel of experts for the TDN ahead of schedule. The system will undergo further development for D1-1

1.4 Deviations from Plan

<i>Causes and Description</i>	<i>Corrective actions</i>
WP4: Changes in the intermediate file formats for MaskVR leading to some disruption to the INT workplan.	The new data formats developed by TV for the MaskVR avatar promise to be more compact and more convenient than older versions. However, the change has caused some delay to work by INT to convert data to MPEG-4 format. At present, it is expected that deadlines will still be met successfully.
M5-3: Initial HamNoSys Refinements. Planned Month 09. Revised Month 11.	Final review in progress. Refinements will be completed in time to contribute to D5-1 Interface Definitions.
WP6: Delays in recruitment by RNID of a Community Evaluation Officer.	No deadlines are threatened as long as recruitment is not delayed much beyond the end of the year. Rescheduling of RNID staff spending is planned.
M6-4: Evaluation of Initial SiGML Tool. Planned Month 10. To be discarded.	Milestone does not require user evaluation in advance of D2-1 Internet Browser Plugin.

2 – Contractual Arrangements

None.

3 - Project Meetings (held and foreseen)

<i>Title</i>	<i>Data and Place</i>	<i>Main conclusions</i>
Visit to UEA of IvD team.	29.08.00 to 02.09.00 Norwich.	IvD and three Dutch signers worked together with UEA researchers to carry out the motion capturing of Sign Language of the Netherlands (SLN) components. The motion data will be used in the implementation of the browser plug-in to enable the automatic translation of actual weather reports into sign language.
Visit to UEA of IDGS team.	12.09.00 to 14.09.00 Norwich.	Three people from UH worked with UEA researchers to carry out motion capture of DGS signs for weather reports for WP2 Browser Plugin demonstrator. Discussions were held on language processing tools for WP5 for the remainder of year 2000.
Consortium Meeting.	05.10.00 to 06.10.00 München.	Will include workpackage meetings for WP1 and WP4 and preparation for Annual Review.
Annual Review.	13.10.00 Brussels.	
IST Conference.	06.11.00 to 08.11.00 Nice.	Presentation of ViSiCAST. WP8 meeting to discuss exploitation.
Visit to INT of WP4 participants.	17.11.00 Paris.	WP4 meeting to consider options for synthesis of signs. Exploration of existing MPEG-4 tools.

4 - Dissemination / Promotional Information

4.1 Conferences and/or Workshops attended/organised/foreseen by the project

<i>Date</i>	<i>Title</i>	<i>No</i>	<i>Number of persons attended + other information</i>
27.04.00	Delivering Independent Access, Nuneaton		Stand and Demonstration. Post Office event held for other businesses to promote disability awareness.
15.05.00	Delivering Independent Access, Eastbourne		Stand and Demonstration.
23.05.00	Delivering Independent Access, Ipswich		Stand and Demonstration.
06.06.00	PAF Annual Conference, Mount Pleasant, London		Royal Mail Event.
15.06.00	BDA Conference, Belfast		ViSiCAST Presentation
22.07.00 to 27.07.00	7 th Int'l Conference on Theoretical Issues in Sign Language Research, Amsterdam		"Virtual Signing: First Steps on the Way to Machine Translation into Sign Language" (UH, IVD)
07.00	53rd MPEG Meeting, Beijing, China		Participation to the AHG (Ad-Hoc Group) on 3D mesh profiles
30.07.00 to 04.08.00	SPIE Conference on Mathematical Modeling, Estimation and Imaging, San Diego, CA		M. Malciu, F. Prêteux, "Tracking facial features in video sequences using a deformable model-based approach"
31.08.00	Presentation and Demonstration to UK DTN Committee	3	Presentation at HQ of Channel Four Television to committee of senior broadcast engineers from BBC and Commercial broadcasting organisations, with a view to the possible adoption of the ViSiCAST system for televised Virtual Human signing. Three persons from ViSiCAST attending (TV x 2; ITC x 1)
13.09.00	Independent Living Exhibition 2000, Wembley		ViSiCAST Presentation
21.09.00 to 24.09.00	EU-workshop "Preparing a European Deaf Network for Information and Communication", Klagenfurt, Austria		<p>Presentation about ViSiCAST with the aim of gaining feedback on (1) how deaf people feel about a signing avatar and (2) how a signing avatar can be used as communication medium in a European Deaf network. About half of the audience was deaf. Their reactions showed that most are open-minded about a signing avatar and value this as potentially useful for communication between deaf and hearing people, as well for the translation of written/spoken language. Some of the suggestions for the use of avatars were:</p> <ul style="list-style-type: none"> • teaching deaf children to use the computer; • a helpdesk for Deaf people who have problems with their computer or with surfing at the Internet; • A Signed Dictionary that can be accessed via the Internet.
26.09.00	Deafway 2000 Exhibition,		ViSiCAST Presentation

	Hove/Brighton		
12.10.00	Deaf Awareness Week Event, Caerphilly		ViSiCAST Presentation
13.10.00 14.10.00	ViSiCAST exhibition, Islington Business Design Centre		ViSiCAST Presentation
14.10.00 15.10.00	Nation Federation of Sub Postmasters Exhibition		ViSiCAST Presentation
18.10.00	Islington Council Deaf Awareness Event		ViSiCAST Presentation
23.10.00 to 27.10.00	54 th MPEG Meeting, La Baule, France		Participation to MPEG-4 SNHC and MPEG-7 groups.
15.11.00	ASSETS 2000, Washington DC, USA.	1	ViSiCAST paper to be presented.

4.2 Articles Published, Press coverage, development web sites, etc.

<i>Date/ Type</i>	<i>Details</i>
15.07.00	Extensive article about ViSiCAST on “See Hear”, the premier programme for Deaf people on BBC television.
01.09.00	Televirtual Corporate WWW site being re-designed and re-launched with new sections dealing with EU research projects, including ViSiCAST.
08.00	“Tracking facial features in video sequences using a deformable model-based approach”, M. Malciu, F. Prêteux presented to SPIE, San Diego.
14.11.00	“Development of Language Processing Support for the ViSiCAST Project” to be presented at ASSETS 2000.

5 – Main results

<i>Description</i>	<i>Details</i>
D3-1 Constrained Post Office System	Successful completion of first major deliverable.
M2-1 Initial SiGML Tool	Steady progress towards Browser Plugin signing SiGML data.
“See Hear” Broadcast	Positive reception by project on premier UK programme for deaf people.
UK TDN Committee	Presentation and Demonstration of prototype broadcast system well received by expert committee. Case made for the viability of the ViSiCAST approach.

Table 6.1 Indicative Effort for the reporting period (Decimal Person Months)

	Work Packages	1	2	3	4	5	6	7	8	TOTAL	
P No	Short Name	Staff Name									
1 ITC		Nick Lodge									
2 IRT		Werner Brückner	0.78							0.78	
		Ittmann	0.45							0.45	
		Zistler	0.63							0.63	
		Christoph Dosch	0.04							0.04	
		Huber	0.06							0.06	
		Schäfer	0.13							0.13	
		Remus	1.49							1.49	
3 TV		Steve Cullingford						0.58		0.58	
		Ben Lambert									
		Matthew Simper		0.08						0.08	
		Farzad Pezeshkpour	1.95	0.99		1.01			0.08	4.03	
		Steve Pye						0.06		0.06	
		Sanja Rankov	0.23			1.40				1.63	
		Marcus Tutt				0.27				0.27	
		Jamie Warren						0.02		0.02	
		John Clark				0.08				0.08	
		Mark Wells	0.23			1.03			0.06	1.32	
4 UH		Volkert Backs		0.39			2.22		0.31	2.92	
		Hortensia Popescu		1.68						1.68	
		Constanze Schmaling		0.23			0.40			0.63	
5 UEA		Richard Kennaway				0.39	0.41			0.80	
		Silko Kruse	1.42							1.42	
		Anne Anderson						0.23		0.23	
		Mike Lincoln			3.11					3.11	
		Eva Safar					2.95			2.95	
		Nuno Dionisio		0.44		0.29	1.13			1.86	
		Kevin Parsons		2.07			1.15			3.22	
6 INT		Françoise Prêteux	0.50							0.50	
		Nicolas Rougon	0.50							0.50	
		Marius Preda	1.50			0.50				2.00	
		Titus Zaharia	0.50							0.50	
7 IvD		Han Frowein		0.40				0.13		0.53	
		Margriet Verlinden		0.78			0.30		0.40	1.48	
		Rick van Dijk		0.67						0.67	
		Erik Borgstein		0.18						0.18	
		Corrie Tijsseling		0.23					0.40	0.63	
8 UKPO		Jo Coy									
		Alan Kennedy			0.04					0.04	
		Rebecca Kent			0.26					0.26	
9 RNID		Amy Hunter					0.29		0.10	0.39	
		Helen Hickey					0.03		0.10	0.13	
		Carolyn Richards									
		Total	10.41	8.14	3.41	4.97	8.56	0.32	0.36	2.11	38.28

Table 6.2 Indicative Effort for the reporting period (Person Hours)

P No	Short Name	Work Packages	Work Packages								Total		
			1	2	3	4	5	6	7	8	P	A	
1	ITC	Nick Lodge											0.0
		WP Actual Hours											0.0
		Planned Hours							172.0				
2	IRT	Werner Brückner	104.0										104.0
		Ittmann	60.0										60.0
		Zistler	84.0										84.0
		Christoph Dosch	6.0										6.0
		Huber	8.0										8.0
		Schäfer	17.0										17.0
		Remus	200.0										200.0
		WP Actual Hours	479.0										479.0
Planned Hours	248.0							13.0	13.0			274.0	
3	TV	Steve Cullingford										76.5	76.5
		Ben Lambert											
		Matthew Simper		10.0									10.0
		Farzad Pezeshkpour	256.5	130.0		132.0					10.0		528.5
		Steve Pye									7.5		7.5
		Sanja Rankov	30.0			183.5							213.5
		Marcus Tutt				35.0							35.0
		Jamie Warren									3.0		3.0
		John Clark				10.5							10.5
		Mark Wells	30.0			135.0					7.5		172.5
		WP Actual Hours	316.5	140.0		496.0					104.5		1057.0
		Planned Hours	64.0	107.0	35.0	518.0			26.0	7.0	23.0		780.0
4	UH	Volkert Backs		50.0				286.0				40.0	376.0
		Hortensia Popescu		217.0									217.0
		Constanze Schmaling		30.0				51.0					81.0
		Actual Hours Total		297.0				337.0			40.0		674.0
Planned Hours		200.0				574.0					774.0		
5	UEA	Richard Kennaway				53.0	56.3						109.3
		Silko Kruse	195.0										195.0
		Anne Anderson								31.0			31.0
		Mike Lincoln			427.5								427.5
		Eva Safar						405.0					405.0
		Nuno Dionisio		60.0		40.0	155.0						255.0
		Kevin Parsons		285.0			157.5						442.5
		WP Actual Hours	195.0	345.0	427.5	93.0	773.8			31.0			1865.3
		Planned Hours	275.0	275.0	481.0	687.0	481.0						2199.0
		6	INT	Françoise Prêteux	63.6								
Nicolas Rougon	63.6												63.6
Marius Preda	190.8					63.6							254.4
Titus Zaharia	63.6												63.6
WP Actual Hours	381.6					63.6							445.2
Planned Hours	127.0			388.0	51.0	13.0	13.0	25.0			617.0		
7	IvD	Han Frowein		48.0						16.0			64.0
		Margriet Verlinden		94.0				36.0			48.0		178.0
		Rick van Dijk		80.0									80.0
		Erik Borgstein		21.0									21.0
		Corrie Tijsseling		27.0							48.0		75.0
		WP Actual Hours		270.0				36.0		16.0	96.0		418.0
Planned Hours		332.0						8.0	96.0		436.0		
8	UKPO	Jo Coy				37.0							37.0
		Rebecca Kent				5.0							5.0
		Alan Kennedy											
		WP Actual Hours				42.0				14.0	14.0	14.0	42.0
Planned Hours													
9	RNID	Amy Hunter							36.0		12.0		48.0
		Helen Hickey							4.0		12.0		16.0
		Carolyn Richards											
		WP Actual Hours							40.0		24.0		64.0
		Planned Hours							161.0		61.0		222.0
Total Actual	1372.1	1052.0	469.5	652.6	1146.8	40.0	47.0	264.5				5044.5	
Total Planned	714.0	914.0	516.0	1593.0	1106.0	214.0	227.0	232.0				5516.0	
Last Period Accum. Actual Total			714.0	914.0	516.0	1593.0	1106.0	214.0	227.0	232.0		3162.5	
Last Period Accum. Planned Total			1203.2	1735.5	922.8	2491.2	2528.0	865.0	536.2	407.3		10689.2	
Accumulated Actual Hrlly Total			2086.1	1966.0	985.5	2245.6	2252.8	254.0	274.0	496.5		8207.0	
Accumulated Planned Hrlly Total			1917.2	2649.5	1438.8	4084.2	3634.0	1079.0	763.2	639.3		16205.2	