St. Petersburg Institute
for Informatics and Automation
of the Russian Academy of Sciences

Mobile services for control and observation with intelligent interface
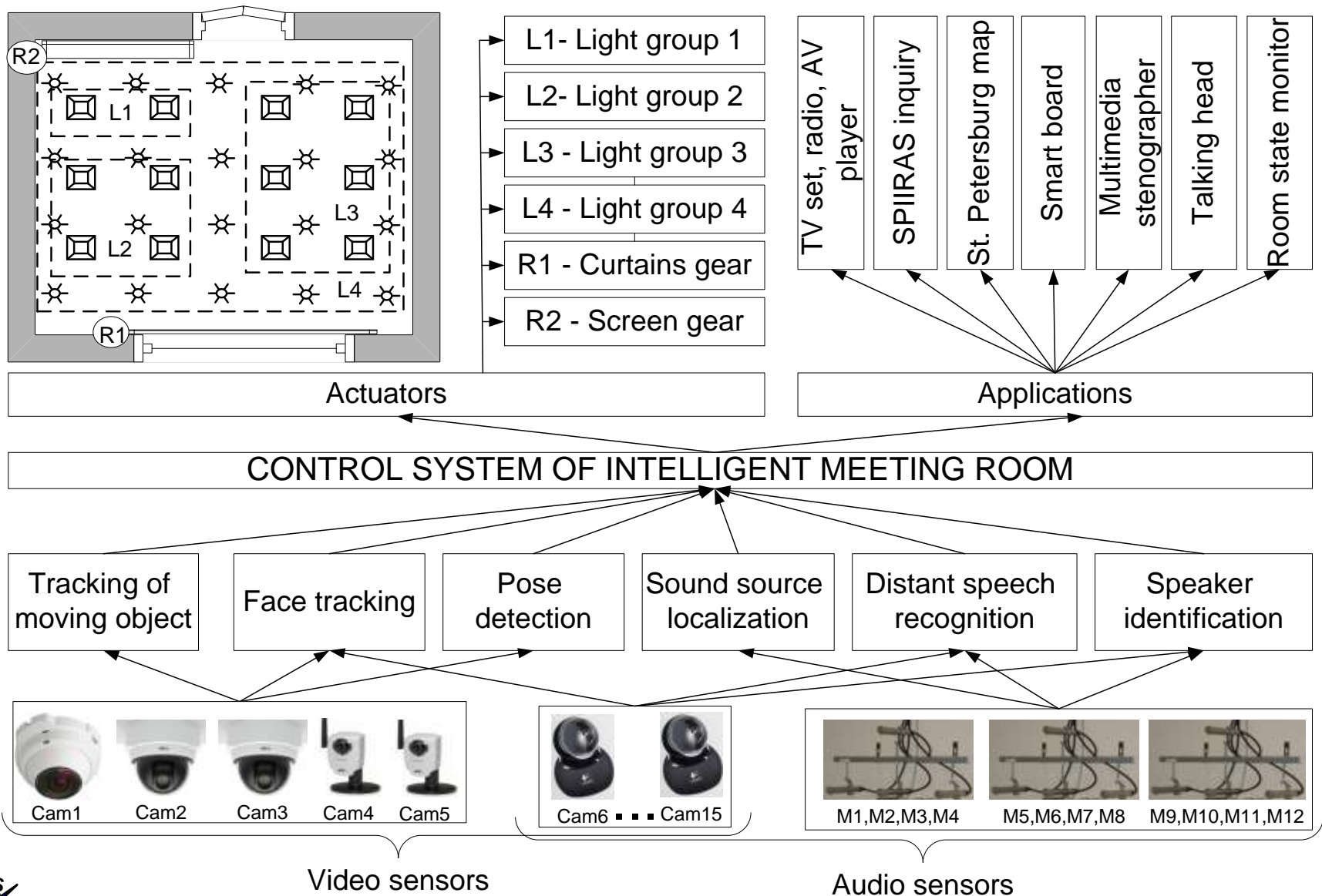
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Outline

- Technological framework of intelligent meeting room

- Web-interfaces and constraints of mobile phones

- Developed mobile services:

  - Remote control meeting room facilities via Nokia mobile devices

  - Web-based application for organization of E-meetings

Technological framework of the intelligent meeting room

- L1- Light group 1
- L2- Light group 2
- L3 - Light group 3
- L4 - Light group 4
- R1 - Curtains gear
- R2 - Screen gear

Actuators

- TV set, radio, AV player
- SPIIRAS inquiry
- St. Petersburg map
- Smart board
- Multimedia stenographer
- Talking head
- Room state monitor

Applications

CONTROL SYSTEM OF INTELLIGENT MEETING ROOM

- Tracking of moving object
- Face tracking
- Pose detection
- Sound source localization
- Distant speech recognition
- Speaker identification

Cam1 Cam2 Cam3 Cam4 Cam5

Cam6 ▪▪▪ Cam15

M1,M2,M3,M4   M5,M6,M7,M8   M9,M10,M11,M12

Video sensors

Audio sensors

Web-interfaces and constraints of mobile phones

♦ Control by dozen controllers with different functions via web browser and mobile phone is not so convenient owing to small screen.

♦ Taking into account limited computational resources of the mobile devices a distributed model of audio-visual processing will be used.

♦ The limited bandwidth of data transmission, depended on the used method of communication

The list of Nokia devices verified at control of the room facilities

Device	Operation system	Screen resolutions	Browser resolution	Auto orientation	Touch-screen
Nokia N73	S60 3rd Edition (initial release) Symbian OS v9.1	240x320 320x240	234x277 234x302 314x200		
Nokia N95	S60 3rd Edition, Feature Pack 1 Symbian OS v9.2	240x320 320x240	234x277 234x302 314x200	+	
Nokia 5800	S60 5th Edition Symbian OS v9.4	360x640 640x360	360x493 360x640 502x288 640x360	+	+
Nokia E61	S60 3rd Edition (initial release) Symbian OS v9.1	320x240	314x200 314x220		
Nokia E60	S60 3rd Edition (initial release) Symbian OS v9.1	352x416	346x346 346x386		
Nokia E90	S60 3rd Edition, Feature Pack 1	800x352	794x284 800x352		
Nokia N810	Maemo Internet Tablet OS 2008 Edition	800x480	696x362 800x480		+

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Examples of web-page layouts

Room facilities control from outside
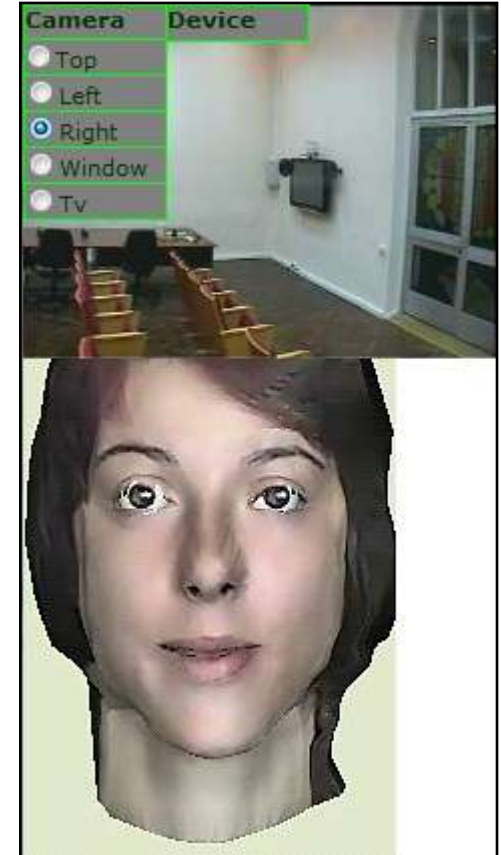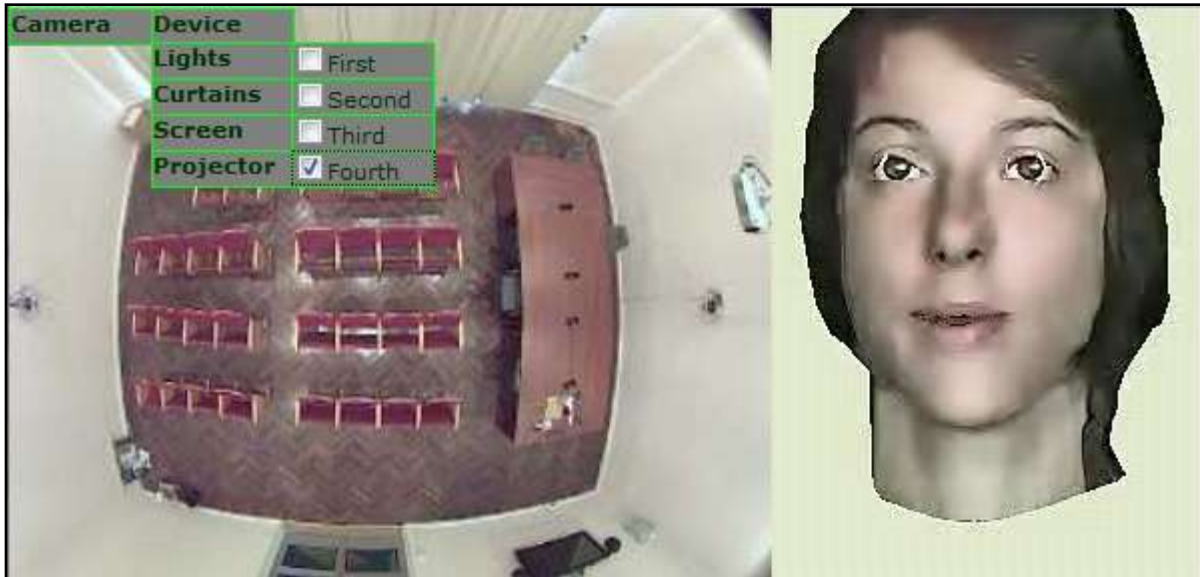
- ♦ Device status is checked using Ajax technology, which allows you to monitor their current status without a full page reload.

- ♦ Also, when changing the status of devices for user is playing audio visual notification.

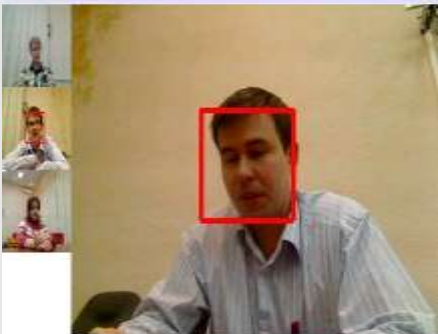# Audio-visual Support of Remote Mobile Participant at E-meeting

♦ Web-based collaboration using the wireless devices that have multimedia playback capabilities is a viable alternative to traditional face-to-face meetings.

♦ E-meetings are popular in businesses because of their cost savings.

♦ To provide quick and effective engagement to the meeting activity, the remote user should be able to perceive whole events in the meeting room and have the same possibilities like participants inside.

Web service for teleconference

- Graphical interface of the web-page contains several basic forms $F = \{F_1, F_2, ... F_{N_F}\}$, where N_F is a number of the forms depending on current meeting state and features of browser

- Content of the forms could be changed during meeting, but it always includes a graphical component from a set $G = \{G_1, G_2, ... G_{N_G}\}$, where N_G is a number of used components

The layout variants of the web-page for E-meeting

Meeting state	Template	Sample
Registration		
Meeting		

For the Registration template:

F_1 G_{10}

F_2

G_5

For the Meeting template:

F_1 F_2

G_5 $G_1/G_2/$
$G_3/G_4/G_6$

Intelligent room outline

- Careful selection and communication among modalities can lead to synergistic reinforcement and overall, a more reliable system.

- The modalities must also be carefully selected in order to make the environment easy to install, maintain, and use under a wide range of environmental conditions.

- Systems that dynamically adjust to the room's activity, such as speech understanding system, and systems that can train themselves and avoid extensive manual calibration, are essential to an intelligent space's success.

Conclusion

♦ The developed intelligent meeting room is a distributed system with the network of intelligent agents (software modules), actuator devices, multimedia equipment and audio-visual sensors

♦ Using Web-based interface lets you manage devices in intelligent room from any device having a browser and internet access

♦ Development of a network of intelligent meeting rooms gives the opportunity to organize a videoconference between spatially distributed participants and facilitates

Thank you!

- Welcome to a demonstration in SPIIRAS

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