

Innovative ways for smart house control equipped with smart electric installation by human interfaces

Petráš J., Džmura J., Balogh J.



Katedra elektroenergetiky
Fakulta elektrotechniky a informatiky
Technická univerzita v Košiciach



NEW TRENDS AND INNOVATIVE INTERFACES

- control by EEG (electro - encephalography) signal,
- control based on emotional state of an individual,
- on targeted brain activity and thoughts,
- based on head orientation, mimics and muscle activity.

These control methods are more natural for people and people with physical disabilities and immobile people would have more facilitated access to smart house device control.



Complex visualization system for smart houses

- target remote device requires features that are now widely commercially available – internet connection and web browser installed camera and microphone.
- For more sophisticated control interfaces such as **voice, movement gestures, brain activity, muscle activity, face mimics, head movement and orientation change** require more demanding target displaying device equipment (microphone, camera, special sensors) which are currently available or will be available in near future (as they are currently in development).

EIBWebVisual

- server web application and currently it serves as a visualization of smart electric systems
- control by standard input – output interfaces such as: keyboard, mouse, display, touchscreen on any target device capable to connect to visualization server, controls specific for mobile devices with accelerometer – device orientation change, control by movement gestures and voice control on devices equipped with camera and microphone

EIBWebVisual

Visualization system is developed as **open** for any other type of **human interface**. Visualization of a smart home or house is made by **open standardized technologies** and its **design is very simple and straightforward**.

A decorative graphic consisting of several sets of concentric circles, resembling ripples in water, located in the bottom right corner of the slide. The circles are light blue and vary in size and opacity, creating a subtle background element.

EIBWebVisual

E I B W e b V i s u a l

Miestnosť LIES-ABB

Icons: [Microphone] [Camera] [Speaker]

Ovládanie osvetlenia

39.84

Svetlo A zapnúť | Svetlo Room A zapnúť | Svetlo Room C zapnúť | Scéna A On

Svetlo A vypnúť | Svetlo Room A vypnúť | Svetlo Room C vypnúť | Scéna A Off

? Žalúzie hore ak je tma

Svetlo B zapnúť | Svetlo Room B zapnúť

Svetlo B vypnúť | Svetlo Room B vypnúť

Air Live WL-2600CAM Wireless Pan-Tilt Night Vision IP Camera www.airlive.com

- Setting
- Client setting
- Image setup
- PT/PTZ control

SIEMENS
Gamma Instabus

- **Simple writing** widget which sends one value to one function.
- **Simple reading widget** reading one value from one function or sensor or actuator.
- **Feedback widget on/off displaying feedback**, reading on/off value from a function, actuator or sensor state.
- **Feedback value** displaying feedback with real number reading value.
- **Cyclical reading** widget reading one value from one group address cyclically, it is an extension of basic reading widget
- **Multi writing** widget sending multiple values to multiple group addresses, functions or actuators made for scene programming.

- **Toggle on/off** widget which is toggling on/off value, write 1, if status is 0 and vice versa.
- **Slider** widget with slider for sending and writing value from a certain value range made especially for light dimming.
- **Text widget** for simple text description widget with no other functionality.
- All reading widgets can be set as **data recording widgets** for read data archiving to text or any other file type or any other target archive device type.
- Widgets with archived data can be set to **display archived data in a graph generated on the fly**.

- **Logical widget** for combination of several input parameters in a logical expression involving logical AND, NOT and OR operators. This widget enables to combine these input values and conditions.

Example of available widgets: **dimming, reading, relative dimming, feedback on/off reading, scene, push button, simple write and logical conditional widget** –

Relative dimming widget writing value relative to current status, suitable especially for light dimming functions.

Push button widget sending values continuously to group address until button is pushed or kept mouse button clicked over it.

- **Speech recognition** widget detecting speech and trigger action on corresponding widget exists as data-speech attribute, not as a separate widget. Speech recognition is language independent and voice independent.
- **Touch screen widgets** include **orientation and swipe gestures on touch screen**. These actions trigger corresponding action.
- **Camera gesture widgets for camera gestures** to trigger widget action, exists as data-gesture attribute, not as a separate widget. This feature is still under development due to accuracy of gesture detection in light noisy environment.
- **Live monitoring camera** feature with iframe live camera for monitoring of controlled room if available.

E I B W e b V i s u a l

Miestnosť LIES-ABB



Ovládanie osvetlenia

39.84

Svetlo A zapnúť



Svetlo Room A zapnúť



Svetlo Room C zapnúť



Svetlo A vypnúť



Svetlo Room A vypnúť

Svetlo B zapnúť



Svetlo Room B zapnúť

Svetlo Room B vypnúť



Svetlo B vypnúť

Scéna A On

Scéna A Off

Scéna B

? Žalúzie hore ak je tma

Žalúzie hore

Lamely hore

Lamely dole

⬇️ Tlačítko žalúzie dole

