

Smart Home – Amiga makes it possible

Achim Kern's vision of an interconnected home

If you carefully read the Amiga Future's last issue you certainly noticed a funny small game about finishing off spiders by chivvying them up with ladders and lasers. You probably ask yourself now what this game "Spider Cave" has to do with the topic "Smart Home".

Well, a lot. First of all there's Spider Cave's author, Achim Kern. He doesn't only tinker with developing small casual computer games but also designs a modular concept to introduce network-, sensor- and phone-technology at home – and the Amiga is part of the action. The second thing in common between Spider Cave and Smart Home is Hollywood. And no, with Smart Home the own home doesn't transform into a spider cave, although it's about spinning webs too but in a totally different context. As much as Hollywood is suited for programming games like Spider Cave you can also use it to build user interfaces for Smart Home applications.

A Smart Home's ingredients

Before we start to go into details we should first of all define the concrete meaning of the phrase Smart Home. Smart Home is the collective term for the regulation, control and automation of all electrically controllable devices at home: controllable garage doors, web cams, baby monitors, smoke- and moisture-detectors, door- and window-sensors, motion detectors, door bells, lighting control /

over the local network to adjust the brightness of the lamps attached. Achim Kern built the user interface for that task with the Amiga-originated development system Hollywood. "I noticed that Hollywood could deliver a perfect user interface to the end-user, something like a control stand to monitor and manipulate the Smart Home environment. So I created the 'LCARS Hollywood Connect' interface", says the automation specialist. Then support for switchable power sockets was added as well as support for those classic sensors and actors you need to monitor and control your Smart Home environment. Raspberry Pi and Arduino mini computers are directly soldered to or connected by network to the measurement and control electronics, act as data loggers and are manageable from outside via Wi-Fi.

Hollywood takes over

For those who don't know the universal application Hollywood: it's a so called "Multimedia Application Layer". Simply spoken this is a system independent development environ-



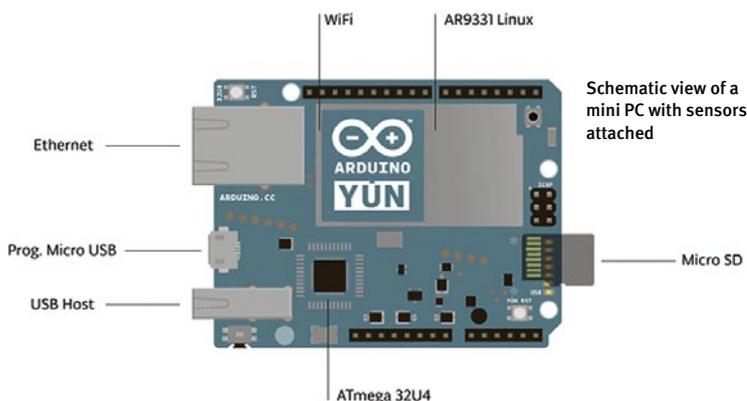
Lots of sensors and a mini PC (Arduino) fit into just one case...



...which already came out of the 3D printer.

The collected data can be stored for later evaluation, for example inside a SQLite databases which are fully supported by Hollywood (you just think about the SQLite front-end "SQLMan" that has

been developed for MorphOS using Hollywood, also check out its review in the previous Amiga Future issue). A Smart Home concept based on Hollywood and SQLite is universally portable because both Hollywood and SQLite are cross-platform.



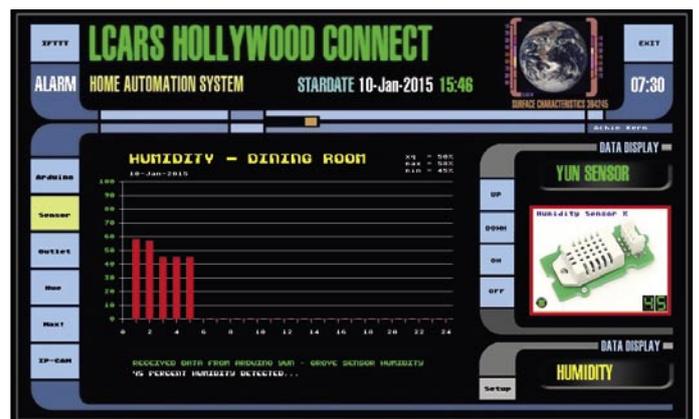
Schematic view of a mini PC with sensors attached

dimming, temperature regulation, water and electricity consumption monitoring.

Fun and technophilia aren't the only reasons why lots of computer nerds like to deal with this topic. There are some good arguments that can even convince the own wife of this "men's toy": safety and cost optimization.

Some time ago Achim Kern, Amiga enthusiast since the 80s and production engineer at Bosch and therefore an expert at this topic, started to control lighting systems by Phillips

ment you can use to build your own graphical user interfaces and the corresponding program logic. The results are so called Hollywood applets which contain both the user interface and the program. Such applets in turn are executed in real-time by the "Hollywood Player". Just like "Spider Cave" "LCARS Hollywood Connect" is such an applet. Conceptionally Hollywood is an interpreter with pre-compiled parts, comparable to Java. And Hollywood also contains network communication functionality.



The LCARS Hollywood Connect interface: Humidity sensor in the dining room

Everything merges inside the Hollywood UI "LCARS Connect" which acts as the command center. At the moment its design redolents of Star Trek's USS Enterprise command consoles. Actually "LCARS" is the abbreviation of "Library Computer Access/Retrieval System" which is the real term from the "Star Trek" universe for the Enterprise control system. The Hollywood application accepts and feeds the respective commands into the Smart Home network, such as to (de)activate the baby

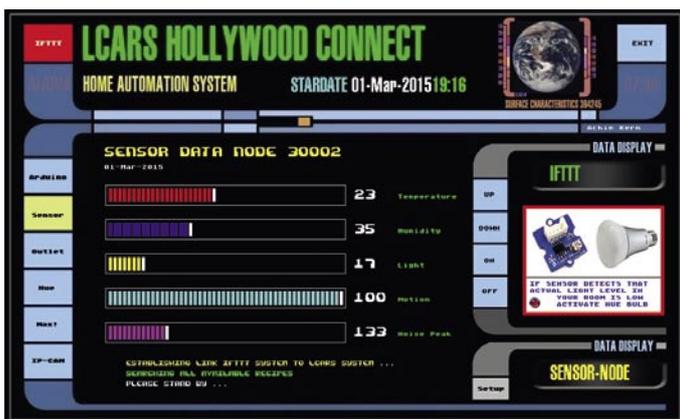
phone, activate the web cam at the house entrance or check the boiler's temperature. The linked Arduino mini computers process those commands, take on the measurement and regulation tasks and report back the information on their activity, which is gathered by Hollywood from where it can be stored inside a database.

Of course Hollywood's programming capabilities also allow defining "workflows", task sequences depending on particular events. That feature could be used to toggle the room lights or power supply sockets at certain times. Movement profiles could be created by evaluating the collected data so that Hollywood knows when you leave the building and what your estimated time of return is. During that period the heaters and lights could be turned off. By using motion detectors the system could easily react to a change of your routine. If you entered the house to a time "unusual" to the system then the lights and heaters would turn on nevertheless.

Alert behavior can be programmed by workflows too. If particular doors open or motion is detected in certain rooms then the so called field devices (the mini PCs in our case) send



The LCARS Hollywood Connect interface on AmigaOS4



Multiple sensors view (temperature, humidity, light, motion, sound)

a corresponding message to the Hollywood system which in turn triggers an alert, optionally directly to your mobile phone by e-mail. Thanks to its web interface the Hollywood GUI could be controlled via tablet or smart phone - even from outside. Hollywood can generate XML pages of its user interfaces and post those to a web server. That way you can turn off stove and light and lock the doors even when on holidays - in case you forgot to do so before and your wife is worried already.

Commander to bridge: please meter the warp core's temperature

You won't find too many warp cores in the typical Amiga Future reader's flat or single-family house. But voice commands would be a great feature nevertheless. Forget Siri and Cortana. "LCARS Hollywood Connect" will contain a built in voice interpreter which understands simple phrases similar to a text adventure's parser (but acoustically) and triggers the matching actions. For example "Computer. Tell me the boiler's temperature."

Large parts of this vision are still dreams of the future. But it's all doable and Achim Kern is working on a modular configuration concept to allow the end user to configure his own Smart Home without having to write a single line of code. It's all taking shape. Not only the LCARS interface exists already, but the corresponding cases for the mini PCs and the sensors can be produced too, the digital blueprints to feed a 3D printer already exist.

Achim Kern plans to write several tutorials to give the interested reader an understanding of the topic Smart Home with Hollywood. Maybe one day the Amiga Future readers will have the pleasure to see a Smart Home workshop here, but this depends on the project's further progress. On his web site you can already find wiring diagrams and first documentation material.

Conclusion

"And what about the Amiga?" one or two readers may ask now. Well, "LCARS Hollywood Connect" is a system independent concept and therefore Achim Kern's potential user base is not limited to the Amiga community. But - and that's no matter of course today - the

Achim Kern's personal profile



Achim Kern, born in 1959, is production engineer and software programmer at Bosch. In his job as supervisor for assembly lines for marine engines he gained a lot of experience regarding the topic automatization. He's a real tech child of the 80s and started like many of today's Amiga fans with programming the ZX81. He was the operator of one of the very first German electronic mailboxes. He's an Amiga 1000 user since the first hour, owns all important classic Amigas and one of each of the three NG Amigas (MorphOS, AROS, OS4). On the Amiga he early made a name for himself with the text adventure "Taran im Abenteuerland", with writing mini games, math learning software and travel guides on CD-ROM. Today he mostly appears as Hollywood developer.

Achim Kern's Smart Home project

www.keho-software.com
www.keho-software.com/smarthome.html (01484)
www.kehosoft.de



Integrated web cam and weather service

Amiga is fully embedded into this subject. After all Hollywood was developed, appeared first and still has its roots on the Amiga. So it's possible to control the whole Smart Home by a web-enabled NG Amiga. In theory an OS3 machine could do it too but that's most likely not feasible due to performance reasons.

Of course the ideal devices to control a Smart Home are smart phones or tablets - and rather no Amiga. But an Amiga could be used to host

Hollywood- and web-servers with the smart phones and tablets acting as terminals. For Windows-, Linux or Mac-users the server component changes accordingly. Or maybe the Hollywood command system will become a cloud service someday and the mobile devices access it by some app. Whatever happens, we'll keep the Amiga Future readers well informed and illustrate how to move the Amiga to the Smart Home's central position.

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