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PRESS RELEASE

World première: EPFL presents "living wall" at the Villa Reuge in Sainte-Croix

Discover BioWall, the pulsating wall !

An intelligent wall, which pulsates beneath its admirers' fingers, repairs itself and even self-replicates, is being exhibited for the very first time at the Villa Reuge in Sainte-Croix, Switzerland, by EPFL researchers. The BioWall, a huge screen made up of artificial cells, reacts to outside stimuli just like any living being. It imitates nature and living things, even possessing two of their fundamental characteristics: the ability to self-repair and to self-replicate.

"Visitors are invited to destroy certain parts of the machine and watch how it repairs itself all on its own," says Christof Teuscher of the EPFL's Logical Systems Laboratory (LSL), who helped to design the BioWall. The computer uses substitute cells to replace the faulty material. Since they do not have any specific function, these cells can replace any cell in the machine, just like original embryo cells. This similarity is no coincidence: for the past decade, the LSL researchers, led by Professor Daniel Mange, have been looking to the complexity of living beings for inspiration in order to create increasingly efficient computer structures.

"Every cell in a living organism," explains Daniel Mange, "contains the individual's genetic inheritance, with its own manufacture and functioning plan: our computer chips are based on the same principle." Every cell in the BioWall also contains every piece of information about the whole machine. Unlike a traditional computer, the BioWall therefore does not need a central "brain" in overall charge.

Not only is the BioWall capable of growing and self-repairing, it can also self-replicate. If there is a major breakdown, it can create a copy of itself or of part of itself (a clone), as long as there is a sufficient number of substitute cells available. Eventually, computers may well live forever and researchers believe that NASA's dream of launching into space intelligent machines capable of self-replication is achievable.

In a more down-to-earth application, integrated circuits capable of self-repairing and self-replicating could be destined for a great future in industry, particularly in fields where safety is needed at all costs, such as aviation or nuclear power stations. At a time when numerous researchers are designing the computer chips of tomorrow at atomic scale, this self-repairing electronic tissue, made of imperfect components but capable of functioning without failure, offers a glimpse of how computers will be designed in the future.

Further information:

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