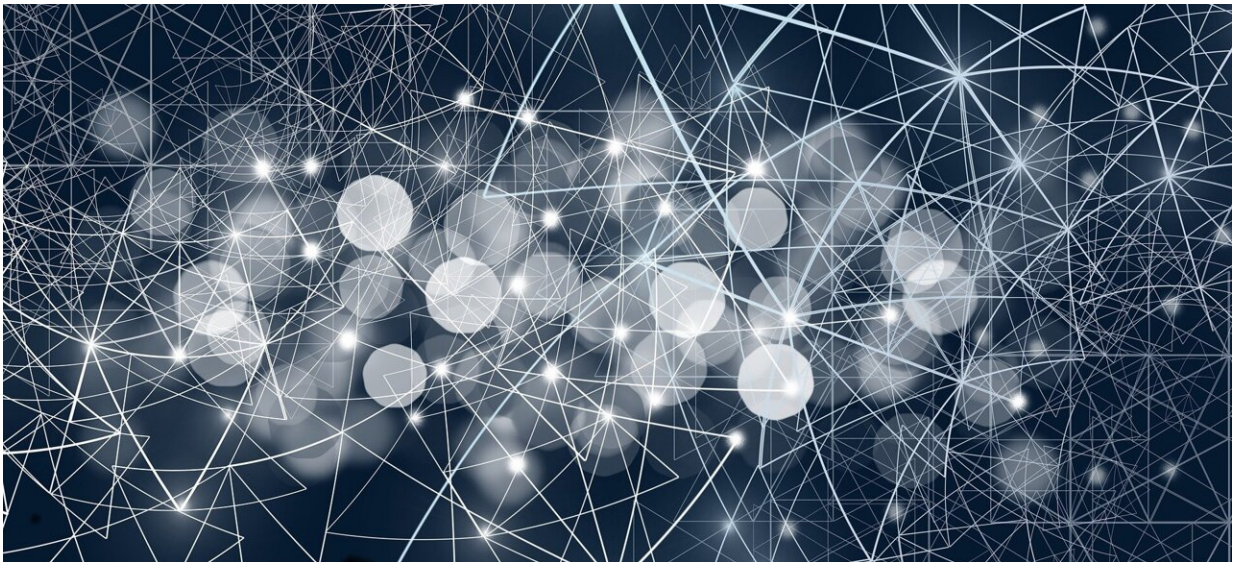


Research keeps AI compatible with smart devices

February 23 2023



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Smart devices keep getting smarter and are demanding more and more out of the hardware. How can we make sure that these devices are compatible with the artificial intelligence needed to keep them functioning, without having to increase the hardware capacity? This is what Nesma Rezk, Ph.D. in Computer Science and Engineering, has been researching in her dissertation.

Nesma Rezk's thesis is about implementing [deep learning](#) applications on

embedded platforms, which is any type of computer system with a dedicated function, such as a smart watch or an autonomous car. Deep learning is a type of [artificial intelligence](#) (AI) technique that teaches computers to learn by example. This technique is for example what makes it possible for a driverless car to recognize different traffic signs, and the technology can be found in everything from smart home gadgets to healthcare instruments.

"The technique raises questions about how you can use these implementations, ensure their efficiency, and cope with the [technological advances](#) in [deep learning algorithms](#) that are continuously being developed to be more intelligent," says Rezk.

Enables AI in daily life

Even though there are advanced hardware platforms offering powerful performance, the high demands of deep learning models for the hardware's computational and memory resources still pose a challenge—and if the hardware and models are not sufficiently compatible, this can limit the efficiency of the resulting implementations.

Rezk was surprised to see that in many cases, it was possible to compress the [deep learning model](#) to less than a quarter of its original size, and still have the model functioning correctly.

"Deep learning applications should not be deployed directly to embedded systems. A prior step called algorithmic optimization should be applied first. Algorithmic optimizations are methods that decrease the requirements of deep learning applications to make it possible to run them on resource-limited platforms while keeping them functioning correctly," she explains.

Rezk believes that her research can be part of the link between deep learning and our daily life.

"By realizing deep learning applications on embedded platforms and making this realization efficient, fast, and robust, we can integrate AI into every aspect of our daily lives," she says.

Provided by Swedish Research Council

Citation: Research keeps AI compatible with smart devices (2023, February 23) retrieved 25 April 2024 from <https://techxplore.com/news/2023-02-ai-compatible-smart-devices.html>

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