

# New methods for more energy-efficient internet services

January 19 2016, by Ingrid Söderbergh

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The billions of people using internet services worldwide require huge data centres resulting in an enormous energy consumption. In her doctoral dissertation at Umeå University, Mina Sedaghat has developed techniques and algorithms to manage and schedule the resources in these large data centres at a lesser cost, more efficiently, more reliably and with a lower environmental impact.

Korean pop-video, Gangnam Style, available on YouTube has had 2.5 billion viewers, which results in a [power consumption](#) of more than 400 GWh. If, in worst case, the electricity to serve such a demand is generated by diesel, it would mean that more than 250,000 tons of CO<sub>2</sub> would be produced, which is equivalent to over 100,000 cars per year.

These examples are not uncommon. Millions of people are using different services such as Google, Facebook, Twitter, and Instagram, every day. This increase in internet usage and the information generated by nearly one billion people entails large data centres with row after row of [servers](#), requiring huge amount of space, electricity and cooling.

The dissertation introduces methods and techniques to efficiently use the servers in the data centres, so that load can be served with fewer resources.

## What technology can be used?

"It could be optimised scheduling systems packing several software components into a few servers in a way that makes full use of processors, memory, bandwidth, network capacity and other resources. In this way, energy efficiency can be improved reducing the negative [environmental impact](#), and at the same time reducing operational costs," says Mina Sedaghat.

**More information:** The dissertation is available online: [urn.kb.se/resolve?urn=urn:nbn:se:umu:diva-112467](https://urn.kb.se/resolve?urn=urn:nbn:se:umu:diva-112467)

Provided by Umea University

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