

## Self-Optimization of Energy-Efficient in the Cloud Computing

**Supervisor:** Prof. Dr. Eng. Krayem Said, CSc.

**Consultant:** Assoc. Prof. Ing. Bc. Chramcov Bronislav, Ph.D., ---

**Department:** Department of Informatics and Artificial Intelligence

**Programme:** Information Technologies

### **Abstract:**

With the recent rapid growth in cloud-based data and application centers, energy-efficiency is a critical factor to reducing power consumption while maintaining best services.

Cloud infrastructures consume a huge amount of energy dangerously impacting the environment. The energy consumption of all data centers worldwide is equivalent to the power consumption of some countries. Therefore, a focus on energy-efficient resource allocation and algorithms is much required to reduce carbon emissions.

The goal of this proposal is to find an approach for scheduling cloud application components to optimize power consumption.

### **Literature:**

- [1] Khattar, Nagma, Jagpreet Sidhu, and Jaiteg Singh. "Toward energy-efficient cloud computing: a survey of dynamic power management and heuristics-based optimization techniques." *The Journal of Supercomputing* (2019): 1-61.
- [2] Mastelic, Toni, and Ivona Brandic. "Recent trends in energy-efficient cloud computing." *IEEE Cloud Computing* 2.1 (2015): 40-47.
- [3] Dabbagh, M., Hamdaoui, B., Guizani, M., & Rayes, A. (2015). Toward energy-efficient cloud computing: Prediction, consolidation, and overcommitment. *IEEE network*, 29(2), 56-61.
- [4] Nguyen, T. H., Di Francesco, M., & Yla-Jaaski, A. (2017). Virtual machine consolidation with multiple usage prediction for energy-efficient cloud data centers. *IEEE Transactions on Services Computing*.
- [5] Khan, M. A., Paplinski, A., Khan, A. M., Murshed, M., & Buyya, R. (2018). Dynamic virtual machine consolidation algorithms for energy-efficient cloud resource management: a review. In *Sustainable Cloud and Energy Services* (pp. 135-165). Springer, Cham..