Yazid Kaced, PhD

Thermal scientist and consultant · Cooling for modular AI data centers

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Profile

Thermal scientist with a PhD on data center cooling, done with Orange Labs. Twelve years of heat transfer, measurement and hour-by-hour modeling, from a container-sized test data room to climatic chambers. Today I review the cooling of modular AI data center projects for investors, and I publish my analyses on hypocaust.dev: heat rejection without chillers, heat reuse, and what happens when cooling stops.

Skills

Data center cooling	Free cooling and chiller-free operation, dry coolers, liquid cooling loops and CDUs, coolant temperatures, containment and airflow, partial PUE, heat reuse (ERF), cooling failure scenarios. Analysis and modeling.
Modeling	Hour-by-hour annual simulation (8,760 hours), multi-zone dynamic models (TRNSYS, TRNFLOW), CFD (Ansys Fluent), sensitivity and uncertainty studies, model checked against measurements.
Measurement	Instrumentation and data acquisition, test protocols, climatic chambers, field trials, thermal imaging.
Software	Python for scientific tools, with tests and documentation. Open-source release with a DOI (Regul'Heat).

Experience

Consultant for investors in modular data centers — Since 2026

- Cooling reviews of modular AI data center projects, in a form investors can read: assumptions, margins and risks.
- Author of Hypocaust (hypocaust.dev): cooling analysis for modular AI data centers, with sources and dated calculations.

Decathlon SportsLab, Lille — Since October 2018

Senior Research Scientist since September 2024. Before: R&D engineer, thermophysiology and thermal comfort.

- Coordinate research on performance in hot to extremely hot environments.
- Climatic chamber and field tests, thermal imaging and thermal manikins. Thermophysiological models (Fiala, Gagge).
- Turn test results into design rules and decisions for product teams. Industrial supervisor of a PhD.

Orange Labs and University of South Brittany (IRDL) — 2014 to 2018

CIFRE PhD in data center thermal engineering, defended on 6 September 2018.

- Adapted a 7 m × 2.5 m test building into an instrumented data room, with a few kilowatts of electric heaters standing in for IT racks.
- Measured indirect free cooling for months in real weather: containment, bypass, recirculation, airflow, leaks.
- Built a multi-zone TRNSYS/TRNFLOW model. It stayed within about 2 °C of the measured air temperatures, often within 1 °C.
- Best partial PUE 1.26 after airflow tuning (cooling fans only). Fan-failure tests: the 110 °C test limit was passed within 7 minutes at 820 W.

Earlier — 2013 to 2018

Co-founder of a car-sharing start-up (Seyara, 2017 to 2018). R&D internships: CFD of cold-rolling lubrication with Ansys Fluent (ArcelorMittal, 2014) and combustion in gas boilers (CNRS, 2013).

Education

PhD, Energy, Heat Transfer and Combustion. University of South Brittany, 2018.

Master's, Fluid Dynamics, Heat Transfer and Energy. Université Paris-Est Marne-la-Vallée, 2014.

Master's, Mechanical Engineering, Energy and Thermal Systems. University of Blida, 2011.

Languages

French, English and Arabic.

Selected publications

Kaced, Y. *Études du refroidissement par free cooling indirect d'un bâtiment exothermique : application au centre de données.* PhD thesis, 2018. theses.fr/2018LORIS499

Kaced, Y. et al. *Experimental and Numerical Study of Indirect Free Cooling in an Exothermic Building.* International HVAC&R Congress, 2017.

Kuklane, K., Kaced, Y. *Footwear for cold weather conditions.* Handbook of Footwear Design and Manufacture, Woodhead, 2021.

Kaced, Y. *Regul'Heat*, heat strain software. Zenodo, 2026. doi.org/10.5281/zenodo.19643221