

Issam RAIS, PhD

Work Experiences

- Since **Associate professor**, *UiT, The Arctic University of Norway*, Tromsø, Norway
- May 2021 Contributing to the energy efficiency of distributed systems, cyber physical and large scale computing systems to reach scalable, robust, configurable and energy efficient systems.
- April 2021 **Post-Doctoral Researcher**, *UiT, The Arctic University of Norway*, Tromsø, Norway
- January 2019 Distributed Arctic Observatory project: provide a cyber physical system that is scalable, robust, configurable and energy efficient to monitoring extreme eco-systems such as the arctic tundra.
Scientific communications: 2 conferences, 1 workshop paper and 1 IEEE Newsletter
- Temporary Associate professor**, *UiT, The Arctic University of Norway*, Tromsø, Norway
Inf-2201, Operating System Fundamentals (Spring 2020)
- September **PhD student**, *ENS Lyon, inria*, Lyon, France
- 2018 "Discover, model and combine energy leverages for large scale energy efficient infrastructures."
- October This thesis defines and investigates the discovery, understanding and usage of leverages available
2015 on a large scale data center or supercomputer. I studied various single leverages and studied them independently. I proposed a generic methodology to study an energy leverage. Then I combined them to other leverages and proposed a generic solution to the dynamic usage of combined leverages.
Scientific communications: 3 journals, 6 conferences and 2 workshop papers
- Spotlight: Whats New In Hpc Research**, *December 2018*, Oliver Peckham
HPCWire dispatches
- September **Trainee**, *ENS Lyon, Defab Company*, Lyon, France
- 2015 Establishment of a scheduler for embarrassingly data parallel tasks according to thermal criteria in a
March 2015 dedicated environment
Scientific communications: 1 conference paper
- June 2014 **Trainee**, *Biology-Chemistry Laboratory*, Orléans, France
- May 2014 Implementation and optimization, using benchmark analysis, of a computing system. Study of GPU vs. CPU for molecular modelling of complex biochemical systems
- August 2013 **C++**, **OpenGL Developer/ Trainee**, *Ascomp Gmbh*, Zürich, Switzerland
- April 2013 Creation and development of CAD tools for TransAT, simulator of a wide range of single and multi-fluid/component flows, and UI improvements
- July 2012 **C++ Developer/ Trainee**, *LIFO*, Orléans, France
- April 2012 Improvement of SkelGIS library and creation of automatic benchmarking tools

Education and training

- 2018 **PhD**, *ENS Lyon, inria, UCBL1, CNRS, LIP Laboratory, Avalon, Roma and Irisa Teams*
- 2015 **Master "High Performance Computing and Simulation"**, *Versailles Saint Quentin (UVSQ)*

Fundings

- 2023 **Hubert Curien Partnership (PHC) France-Norway 2023, Joint-Team**, *Aurora PHC*,
- 2025 *Campus France and the Research Council of Norway (RCN)*,
Norwegian Program Leader
- 2023 **North2north program**, *Uarctic*,
Program Laureate
- 2022 **French-Norwegian collaboration**, *Programme Åsgard*,
Program Laureate
- 2021 **Facilitate digital mobility through a configurable experimental test-bed**,
NORDTEK 2021 EXTRA Call on Support for Digital Activities, hardware,
15 498 €

Scientific communications

International Journals

- 2019 **Performance and energy analysis of OpenMP runtime systems with dense linear algebra algorithms**,
IJHPCA
João Vicente Ferreira Lima, Issam Raïs, Laurent Lefèvre, Thierry Gautier
- 2018 **Quantifying the impact of shutdown techniques for energy-efficient data centers**,
CCPE
Issam Raïs, Anne-Cécile Orgerie, Martin Quison and Laurent Lefèvre
- 2017 **Reducing the energy consumption of large scale computing systems through combined shutdown policies with multiple constraints**,
IJHPCA
Anne Benoit, Laurent Lefèvre, Anne-Cécile Orgerie, and Issam Raïs

International Conferences

- 2024 **Fast Choreography of Cross-DevOps Reconfiguration with Ballet: A Multi-Site OpenStack Case Study**,
IEEE International Conference on Software Analysis, Evolution and Reengineering (SANER 2024), Rovaniemi, Finland
Jolan Philippe, Antoine Omond, Hélène Coullon, Charles Prud'Homme and Issam Raïs
- 2023 **Design and Evaluation of Single-Board Computer Based Power Monitoring for IoT and Edge Systems**,
The 19th IEEE Green Computing and Communications (GreenCom 2023), Hainan, China
Loic Guegan Salma Tofaily and Issam Raïs
- 2023 **Evaluating the energy consumption of adaptation tasks for a CPS in the Arctic Tundra**,
The 19th IEEE Green Computing and Communications (GreenCom 2023), Hainan, China
Antoine Omond, Hélène Coullon, Issam Raïs and Otto Anshus
- 2023 **Leveraging Relay Nodes to Deploy and Update Services in a CPS with Sleeping Nodes**,
The 16th IEEE International Conference on Cyber, Physical and Social Computing (CPSCoM 2023), Hainan, China
Antoine Omond, Hélène Coullon, Issam Raïs and Otto Anshus

- 2023 **Representing Power Variability of an Idle IoT Edge Node in the Power State Model,**
The 16th IEEE International Conference on Cyber, Physical and Social Computing (CPSCoM 2023), Hainan, China
 Salma Tofaily Issam Rais and Otto Johan Anshus
- 2022 **LoRaLite: LoRa protocol for Energy-Limited environments,**
MASCOTS 2022, Nice, France
 Lukasz Sergiusz Michalik, Loic Guegan, Issam Raïs, Otto Anshus and John Markus Bjørndalen
- 2022 **Impact of loosely coupled data dissemination policies for resource challenged environments,**
CCGrid 2022, Taormina, Italy
 Issam Raïs, Loic Guegan, Otto Anshus
- 2021 **Impact of image compression on CNN performance metrics for CPS nodes at the Arctic Tundra,**
IEEE CPSCoM-2021, Melbourne, Australia
 Steffen Randrup, Issam Raïs, John Markus Bjørndalen, Phuong Hoai Ha, Otto Anshus
- 2021 **Experiences Building and Deploying Wireless Sensor Nodes for the Arctic Tundra,**
CCGRID 2021, Melbourne, Australia
 Michael J. Murphy, Øystein Tveito, Eivind Flittie Kleiven, Issam Raïs, Eeva M. Soininen, John Markus Bjørndalen, Otto Anshus
- 2020 **Trading Data Size and CNN Confidence Score for Energy Efficient CPS Node Communications,**
CCGRID 2020, Melbourne, Australia
 Issam Raïs, Otto Anshus, John Markus Bjørndalen, Daniel Balouek-Thomert, Manish Parashar
- 2019 **Leveraging energy-efficient non-lossy compression for data-intensive applications,**
HPCS 2019, Dublin, Ireland
 Issam Raïs, Daniel Balouek-Thomert, Anne-Cécile Orgerie, Laurent Lefèvre, Manish Parashar
- 2018 **Automatic Energy Efficient HPC Programming: A Case Study,**
ISPA2018, Melbourne, Australia
 Issam Raïs, Helene Coullon, Laurent Lefevre and Christian Perez
- 2018 **Exploiting the Table of Energy and Power Leverages,**
ICA3PP2018, Guangzhou, China
 Issam Raïs, Laurent Lefevre, Anne-Cécile Orgerie, Anne Benoit
- 2018 **Building the Table of Energy and Power Leverages for Energy Efficient Large Scale Systems,**
HPCS2018, Orléans, France
 Issam Raïs, Mathilde Boutigny, Laurent Lefèvre, Anne-Cécile Orgerie and Anne Benoit
- 2018 **Thermal aware scheduling on distributed computing water heaters,**
CCNC 2018, Las Vegas, USA
 Issam Raïs, Eddy Caron and Laurent Lefèvre
- 2017 **Shutdown policies with power capping for large scale computing systems,**
Europar 2017, Saint Jacques de Compostel, Spain
 Anne Benoit, Laurent Lefèvre, Anne-Cécile Orgerie and Issam Raïs
- 2017 **Towards Energy Budget Control in HPC,**
CCGRID 2017, Madrid, Spain
 Pierre-François Dutot, Yiannis Georgiou, David Glesser, Laurent Lefèvre, Millian Poquet, and Issam Raïs
- 2016 **Impact of Shutdown Techniques for Energy-Efficient Cloud Data Centers,**
ICA3PP 2016, Granada, Spain
 Issam Raïs, Anne-Cécile Orgerie, and Martin Quinson

Workshops

- 2023 **Quantifying the variability of power and energy consumption for IoT edge nodes**, *UrbCom 5th International Workshop on Urban Computing (UrbCom, DCOSS-IoT 2023)* , Coral Bay, Pafos, Cyprus
Salma Tofaily, Issam Raïs, Otto Anshus
- 2023 **Weather-Aware Wake-Up of Sleeping Cyber-Physical IoT Nodes**, *1st International Workshop on Long and Short Range Wireless Technologies Applied to IoT for Networks of Tomorrow (LS-NoT, DCOSS-IoT 2023)* , Coral Bay, Pafos, Cyprus
Steffen Randrup, John Markus Bjørndalen, Issam Raïs, Phuong Hoai Ha and Otto Anshus
- 2023 **Validation of esds using epidemic-based data dissemination algorithms**, *5th International Workshop on IoT Applications and Industry 5.0 (DCOSS-IoT 2023)* , Coral Bay, Pafos, Cyprus
Loic Guegan, Issam Raïs and Otto Anshus
- 2021 **Distribution of Updates to IoT Nodes in a Resource-Challenged Environment**, *Cloud2things (CCgrid2021)*, Melbourne, Australia
Robert Tollefsen, Issam Raïs, John Markus Bjørndalen, Phuong Hoai Ha, Otto Anshus
- 2019 **UAVs as a leverage to provide energy and network for Cyber-Physical Observation Units on the Arctic Tundra**, *Wi-DroIT 2019*, Santorini, Greece
Issam Raïs, John Markus Bjørndalen, Phuong Hoai Ha, Ken-Arne Jensen, Lukasz Sergiusz Michalik, Havard Mjøen, Øystein Tveito, Otto Anshus
- 2017 **Performance and Energy Analysis of OpenMP Runtime Systems with Dense Linear Algebra Algorithms**, *WAMCA 2017*, Campinas, Brazil
João Lima, Issam Raïs, Laurent Lefèvre and Thierry Gautier
- 2016 **An analysis of the feasibility of energy harvesting with thermoelectric generators on petascale and exascale systems**, *OPTIM 2016*, Innsbruck, Austria
Issam Raïs, Laurent Lefèvre, Anne Benoit, and Anne-Cécile Orgerie

Presentations, demos and newsletter

- 2023 **Towards an efficient ground-based monitoring of the arctic tundra through a distributed system, the DAO-CPS approach**, *Eclipse IoT Day Grenoble 2023*, Invited talk
- 2020 **Challenges Monitoring the Arctic Tundra: The Distributed Arctic Observatory Cyber-Physical System**, *IEEE IoT Newsletter*, Issam Raïs, Otto Anshus, Phuong Hoai Ha, John Markus Bjørndalen
- 2017 **Shutdown policies with power capping for large scale computing systems : the ELCI solution** , *SuperComputing 2017 (SC17)*, Denver, USA
- 2016 **Impact of Shutdown Techniques for Energy-Efficient Cloud Data Centers**, *Green-Days 2017*, Nantes, France
- 2016 **Towards Green Exascale Challenges**, *CompasGreen 2016*, Lorient, France
- 2015 **New generation of eco-responsible distributed supercomputer** , *Rencontre INRIA-industrie*, Paris, France

Supervision

Advising

Since January 2022 **Energy leveraging for edge and IoT systems**, *Salma Tofaily*, PhD Student
UiT, the arctic university of Norway

- Since December 2021 **Energy aware decentralized execution of reconfiguration in scarce resource environments**, *Antoine Omond*, PhD Student, main Co-supervision
IMT Atlantique / UiT, the arctic university of Norway
- Since May 2020 **Simulator for large scale CPS, IoT and edge systems**, *Loic Guegan*, Postdoc
UiT, the arctic university of Norway
- May 2022 **Exploring the Challenges of a Flexible, Feature Rich IoT Testbed**, *Alexander Jakobsen Hansen*, Master Project, 60 Credits Project
August 2023 UiT, the arctic university of Norway
- May 2022 **Characteristics and architecture of a IoT scientific distributed test-bed**, *Maxime Bruno*, From ENS Lyon, M1 project
July 2022 UiT, the arctic university of Norway
- July. 2022 **Ensuring uninterrupted cold chain from Norway to China**, *Erling Arvola Devold*,
Dec. 2022 Capstone Project, 20 Credits Project
UiT, the arctic university of Norway
- Dec. 2020 **Leader election for observation units deployed on the Arctic Tundra**, *Thomas Lund Fagermyr*, Capstone Project, 20 Credits Project
Sept. 2020 UiT, the arctic university of Norway
- May 2021 **A modular approach to units composing scientific observatories**, *Hiroataka Sato*,
August 2020 Master Project, 60 Credits Project
UiT, the arctic university of Norway
- Co-advising
- Since January 2020 **Cyber-physical analytics system spanning from the edge to the cloud**, *Steffen Randrup*, PhD Student, DAO project
UiT, the arctic university of Norway
- June 2022 **Distributed storage and energy consumption: A quantitative analysis for HPC**,
August 2022 *Gregoire Doebele*, Master Student
UVSQ, Université de Versailles Saint-Quentin-en-Yvelines
- August 2021 **Non-Opportunistic data transfer for IoT and Cyber-Physical Systems with mostly sleeping nodes**, *Isak Østrem Hellemo*, Master Project, 30 Credits Project
May 2022 UiT, the arctic university of Norway
- August 2021 **Building a Neighborhood Resource Map for IoT and Cyber-Physical systems in Resource-Constrained Environments**, *Sindre Sønvisen*, Master Project, 60 Credits Project
May 2022 UiT, the arctic university of Norway
- May 2021 **General Monitoring of Observational Units in the Arctic Tundra**, *Erlend Melum*
August 2020 *Karlstrøm*, Master Project, 60 Credits Project
UiT, the arctic university of Norway
- May 2021 **Clock Synchronization between Observational Units in the Arctic Tundra**, *Sigurd*
August 2020 *Karlstad*, Master Project, 60 Credits Project
UiT, the arctic university of Norway
- June 2019 **DaoCron, Job Scheduler for Autonomous Observation Units in the Arctic Tundra**,
January 2019 *Martin Carstens*, Master Student, DAO project
UiT, the arctic university of norway
- Mars 2018 **Implementation of a framework to automatically discover, benchmark and evaluate energy leverages**, *Mathilde Boutigny*, Research Engineer, ELCI project
October 2016 ENS Lyon

May 2016 **Automation of monitoring of a large scale infrastructure**, *Olivier Mornard*, Research
March 2016 Engineer, MOEBUS Project
ENS Lyon

Scientific Responsibilities

International collaborations

2017 **Visit and collaborative work for SUSTAM (Avalon - RDI2) joint team**, *Rutgers University*, New Jersey, USA

International External Expert

2023 **France, National Research Agency (Agence Nationale de la Recherche (ANR)), Panel CE25**, Software sciences and engineering - Multi-purpose communication networks, high-performance infrastructures

Organizer

2022 **COEMS Forsterk Seminar 2022**, *Local organizer*, Tromso

2019 **RDI2 - DAO workshop**, *Collaborative Workshop*, Tromso

PC member

2024 **Parallel AI and Systems for the Edge**, *PAISE 2024*, Symposium

2024 **The Seventh Workshop on Hot Topics in Cloud Computing Performance**, *Hot-CloudPerf24*, Workshop ICPE 2024

2023 **The 1st International Workshop on Trust in AI, Services and Networking**, *TAISEN 2023*, Workshop, ICNP 2023

2023 **1st International Workshop on Urgent Analytics for Distributed Computing**, *QuickPar 2023*, Workshop, Euro-Par 2023

2023 **International Conference on Computational Science**, *ICCS 2023*, Symposium

2023 **ACM/SPEC International Conference on Performance Engineering 2023**, *ICPE 2023*, Symposium

2022 **International Conference on Computational Science**, *ICCS 2022*, Symposium

2021 **IEEE/ACM International Symposium on Cluster, Cloud and Internet Computing**, *CCGRID 2021*, Symposium

2019 **InterCloud-HPC 2019**, *HPCS2019*, Symposium

2019 **Euro-EDUPAR 2019**, *EUROPAR2019*, Symposium

Special Session Chairs

2021 **The 16th International Conference on Green, Pervasive, and Cloud Computing**, *GPC 2021*, Symposium

Evaluation committee

2021 **The Mask: Masking the effects of Edge Nodes being unavailable**, *Iliia Zhakun*, Master Student, Internal Examiner, leader of the committee

Reviewer, Journal Papers

2019 **ACM Transaction on Sensor Networks (TOSN)**

2018 **IEEE Transactions on Sustainable Computing (TSUSC)**

2017 **IEEE Transactions on Parallel and Distributed Systems (TPDS)**

Reviewer, Conference Papers

2019 **48th International Conference on Parallel Processing**

2019 **24th international European conference on parallel and distributed computing**

- 2018 **23th international European conference on parallel and distributed computing**
- 2016 **5th international conference on advances in communication and informatics**
 Reviewer, Workshop and Poster Papers
- 2017 **IEEE/ACM International Symposium on Cluster, Cloud and Internet Computing (CCGRID 2017)**, 2 Poster Papers
- 2016 **The 2016 International Conference on High Performance Computing & Simulation (HPCS 2016)**

Course responsible

- 2022 **Parallel Programming**, *UiT*, Tromso (Norway)
 Inf-3201 (Fall 2022)

Lectures (60 hours)

- 2023 **Operating System Fundamentals**, *UiT*, Tromso (Norway)
 Inf-2201 (Spring 2022)
- 2022 **Parallel Programming**, *UiT*, Tromso (Norway)
 Inf-3201 (Fall 2022), with Loic Guegan and Hoai Phuong Ha
- 2022 **Operating System Fundamentals**, *UiT*, Tromso (Norway)
 Inf-2201 (Spring 2022)
- 2021 **Parallel Programming**, *UiT*, Tromso (Norway)
 Inf-3201 (Fall 2021), with John Markus Bjørndalen
- 2020 **Operating System Fundamentals**, *UiT*, Tromso (Norway)
 Inf-2201 (Spring 2020), with Tore Brox-Larsen

Teaching Assistant (124 hours)

2018 (62 hours)

- Parallel Computing (M1)**, *UCBL1*, Lyon (France)
- Distributed Algorithms (M1)**, *UCBL1*, Lyon (France)
- Project (L3)**, *ENS Lyon*, Lyon (France)

2017 (36 hours)

- Parallel Computing (M1)**, *UCBL1*, Lyon (France)
- Distributed Algorithms (M1)**, *UCBL1*, Lyon (France)
- Networking (L3)**, *UCBL1*, Lyon (France)
- Web (L1)**, *UCBL1*, Lyon (France)

2016 (26 hours)

- Integrated Projects (M1)**, *ENS Lyon*, Lyon (France)

Community Service

- 2016 **PhD representative in the "Commission consultative des doctorants"** , *Inria*
- 2018 Elected
- 2018 **ENS PhD Days** , *ENS Lyon*
 Organizer

References

- Professor **Otto Anshus**, *UiT*, otto.anshus@uit.no
- Professor **Laurent Lefevre**, *ENS Lyon*, *Inria*, laurent.lefevre@ens-lyon.fr

Associate **Hélène Coullon**, *IMT Atlantique Bretagne Pays de la Loire*, helene.coullon@imt-
professor atlantique.fr