

MSc í vélaverkfræði

MSc í rafmagnsverkfræði

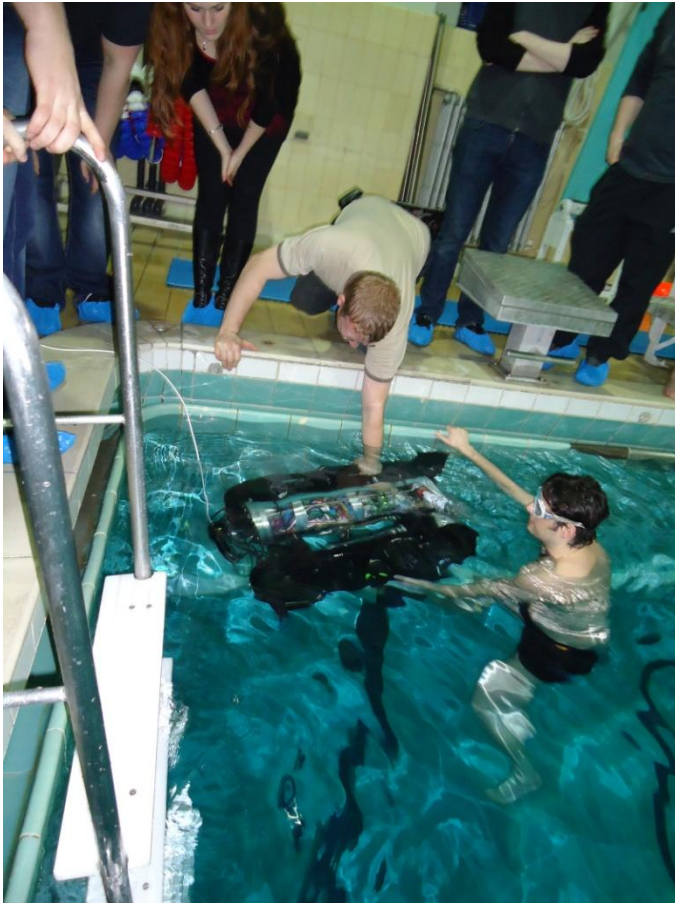
Framhaldsnám á véla og rafmagnssviði



Uppbygging náms

- 120 ECTS einingar (2 ár)
- Verkefni ýmist 30 eða 60 einingar
- Kjarni í náminu er Sampætt verkefni, Hönnunarverkefni sem stutt er af viðeigandi námskeiðum. Í allt 36 einingar.
- Önnur námskeið valin eftir smekk eða í samráði við leiðbeinanda

Sambætt verkefni



- Stórt hönnunarverkefni
- Byggir á:
 - Mekanískri hönnun
 - Skynjun, rafeindatækni og stýringum
 - Gervigreind
- Kenna verkfræði út frá því að gera hlutina!

Skipulag

	Fall	Spring
Mandatory	<p>Linear dynamical systems (8)</p> <p>Sensors & controllers (8)</p>	<p>Integrated project (12)</p> <p>Autonomous robots (8)</p>
Electives 2010 - 2011	<p>Advanced circuit design (8)</p> <p>Machine learning (8)</p> <p>Energy carriers and storage (6)</p> <p>Partial differential equations (8)</p> <p>Num. fluid flow & heat transf. (8)</p>	<p>Microwave engineering (8)</p> <p>Advanced fluid mechanics (8)</p> <p>Overview of sustainable energy systems (6)</p> <p>Special topics in engineering (6)</p> <p>Energy in industrial processes(6)</p>
Electives 2011 - 2012	<p>Solid state electronics (8)</p> <p>Plasma physics (8)</p>	

Vélaverkfræði

	Fall	Spring
Mandatory	<p>Linear dynamical systems (8)</p> <p>Sensors & controllers (8)</p>	<p>Integrated project (12)</p> <p>Autonomous robots (8)</p>
Electives 2010 - 2011	<p>Advanced circuit design (8)</p> <p>Machine learning (8)</p> <p>Energy carriers and storage (6)</p> <p>Partial differential equations (8)</p> <p>Num. fluid flow & heat transf. (8)</p>	<p>Microwave engineering (8)</p> <p>Advanced fluid mechanics (8)</p> <p>Overview of sustainable energy systems (6)</p> <p>Special topics in engineering (6)</p> <p>Energy in industrial processes(6)</p>
Electives 2011 - 2012	<p>Solid state electronics (8)</p> <p>Plasma physics (8)</p>	

Rafmagnsverkfræði

	Fall	Spring
Mandatory	Linear dynamical systems (8) Sensors & controllers (8)	Integrated project (12) Autonomous robots (8)
Electives 2010 - 2011	Advanced circuit design (8) Machine learning (8) Energy carriers and storage (6) Partial differential equations (8) Num. fluid flow & heat transf. (8)	Microwave engineering (8) Advanced fluid mechanics (8) Overview of sustainable energy systems (6) Special topics in engineering (6) Energy in industrial processes (6)
Electives 2011 - 2012	Solid state electronics (8) Plasma physics (8)	

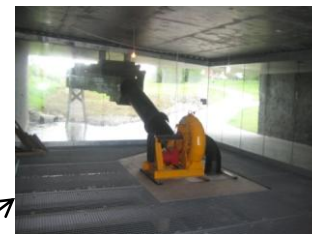
Orkusetur: Industry – Research - Education



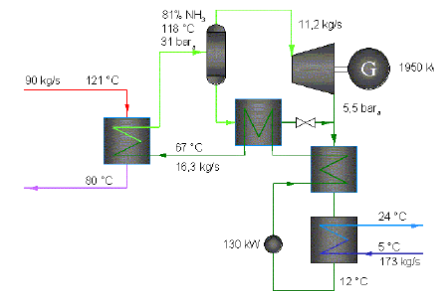
Alternative fuels



Village Power

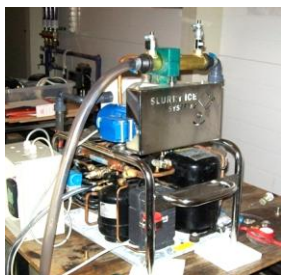


Microhydro



Mynd 3.3.1. Rafstöð – Einfölduð vinnslurás.

Advancing geothermal



Energy solutions for fishing industry



Energy solutions for heavy industry



Transportation solutions



Group members

Energy research

Faculty

Guðrún Sævarsdóttir
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William Scott Harvey
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Students

María Guðjónsdóttir (PhD) – HP
Ingi Heimisson (MSc) – HP
Kalyan Chivucula (MSc)
Tao Pai-chun (MSc) – HS

Collaborators

Halldór Pálsson HÍ
Hlynur Stefánsson
Guðni Axeson ISOR
Jónas Elíasson HÍ
GM Haarberg NTNU

Geothermal:

- Two phase flow in reservoirs and gathering systems
- Technical solution for supercritical geothermal fluids

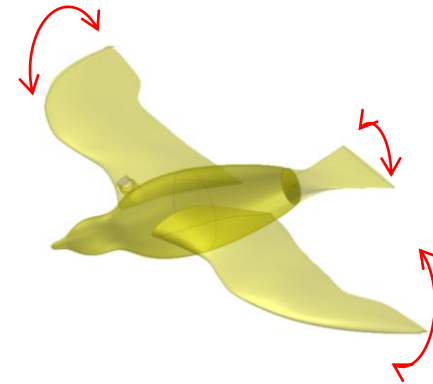
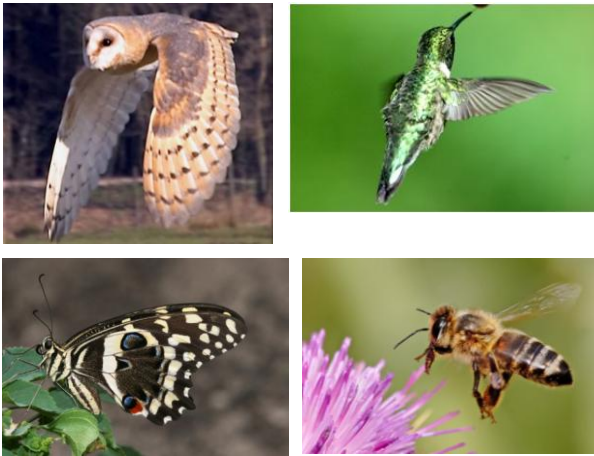
Industry

- Blending Methanol from recycled CO₂ to traditional fuels (CRI)
- Alternative energy resources in battery production (Volcanic Batteries)
- Heat recovery from aluminum reduction cells (Norðurál, Norsk Hydro)
- Novel approach to increasing current density in aluminum reduction cells (Alcoa, NTNU)



Laboratory for Unmanned Vehicles [<http://luv.ru.is>]

Leifur Þór Leifsson [leifurth@ru.is]



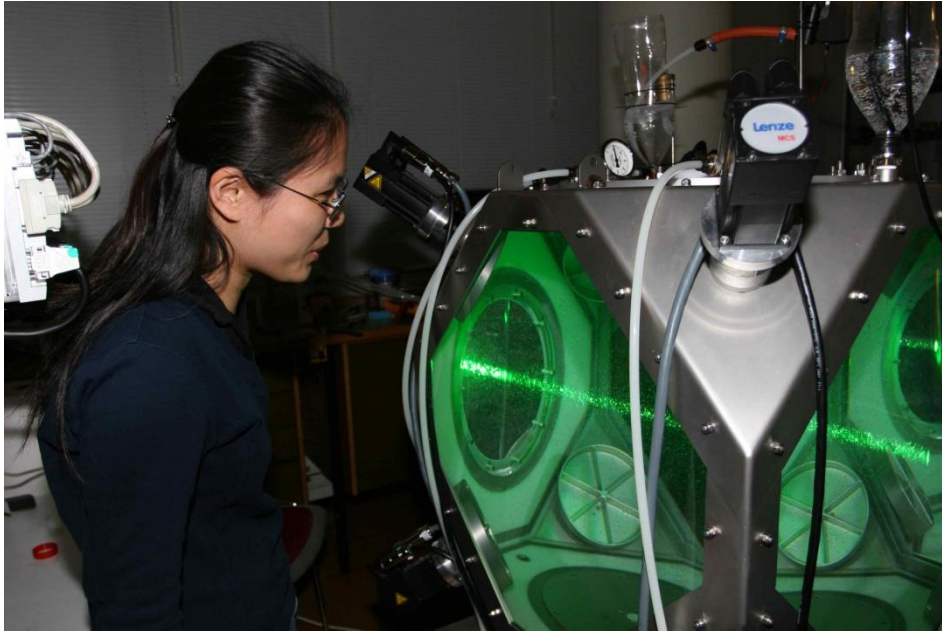
Flapping-Wing Unmanned Air Vehicle



Autonomous Underwater Vehicle

Droplet formation in Clouds

Laboratory for Fundamental Turbulence Research
Ármann Gylfason, armann@ru.is



Cloud simulator: Turbulence in a Box

- MS Projects

- Motions of inertial particles in buoyancy driven turbulent flows
- Effects of straining on particle coalescence in turbulence



Vacuum electronics:

Applications:

- High power microwave amplifiers.
- Electron, and charged particle beam devices.
- Space communications.
- Microscale vacuum electronics (flat panel displays, THz devices)

Research:

- Fundamental processes in vacuum electronic devices.
- Computational modeling.

Investigators:

Ágúst Valfells av@ru.is
Andrei Manolescu manoles@ru.is

Geothermal energy:

Applications:

- Designing strategies for sustainable production.

Research:

- Optimisation of production under uncertainty.
- Lumped parameter modeling for high temperature fields.

Investigators:

Ágúst Valfells
Hlynur Stefánsson
Halldór Pálsson (HÍ)

Silja Rán Sigurðardóttir, Ph.D. Student
Björn Sveinbjörnsson, M.S. student





Nanophysics group

Group members



Faculty

Andrei Manolescu manoles@ru.is
Halldór G. Svavarsson halldorsv@ru.is
Sigurður I. Erlingsson sie@ru.is

Students

Gunnar Þorgilsson, PhD student
Kristinn Torfason, PhD student
Timur Borykov, PhD student
Csaba Daday, Msc student



Some research topics:

- Electronic properties of nanodevices and nanoelectronics
- Semiconductor physics
- Semiconductor fabrication and growth (thin films, solar cells)
- Charge and spin transport in nanonstructures
- Coulomb interaction and time-dependent phenomena
- Spintronics and quantum computation
- Photonics and quantum optics



Talvinnsla og mynsturgreining

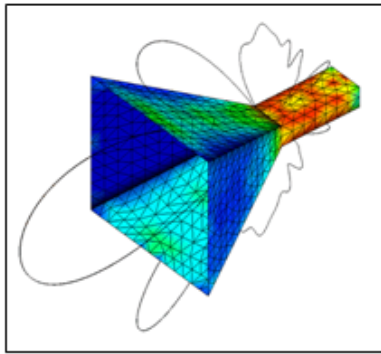
-Jón Guðnason, jg@ru.is

- Raddgreining (e. Speaker recognition)
 - Einkennaval byggt á talvísindum
 - Hönnun flokkara (GMM, SVM og Random Forests)
- Talgreining (e. Speech Recognition)
 - Einkennaval fyrir hljóðgreiningu
 - Kvik líkön fyrir hljóðgreiningu
- Suðsíun tals (e. Speech Enhancement)
 - Notkun merkjafræði við að laga tal í suði



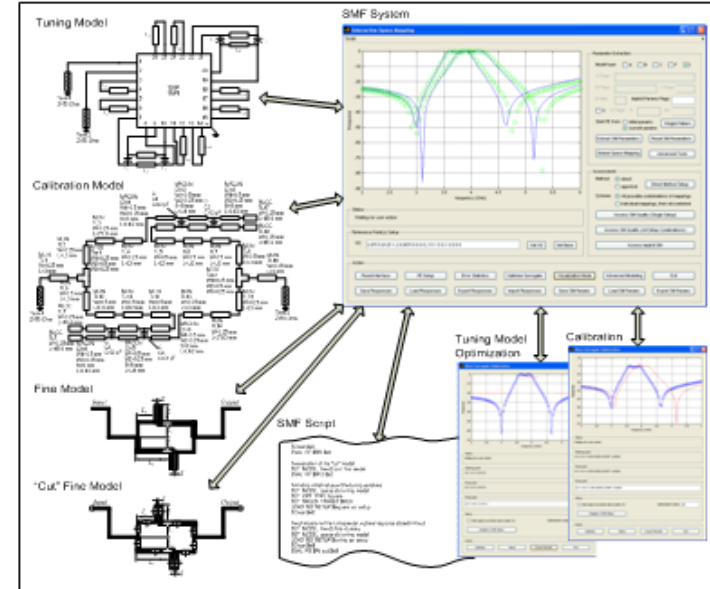
EOMC conducts research related to various aspects of computer-aided engineering design optimization and modeling as well as applications for microwave/RF and aerospace engineering

EOMC offers a number of research projects for students pursuing Masters degree in Electrical or Mechanical Engineering



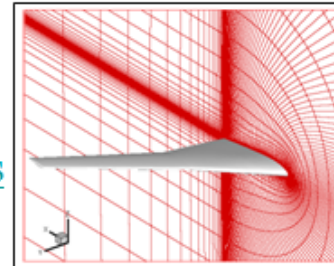
Example projects in Electrical Engineering:

- [Surrogate-based optimization techniques for computer-aided microwave design](#)
- [Simulation-based tuning for microwave design optimization](#)
- [Design and optimization of antennas for personal communication using space mapping technology](#)

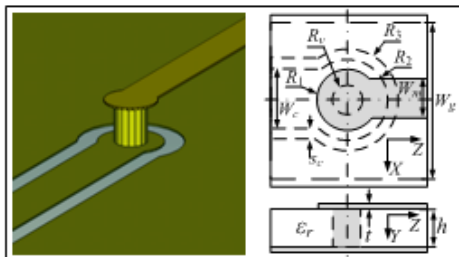


Example projects in Mechanical Engineering:

- [Computationally efficient aerodynamic shape optimization using physics-based models](#)
- [Development of flapping-wing unmanned air vehicles](#)



All the projects involve numerical simulations using both electromagnetic solvers and circuit simulators (Electrical Engineering projects) and computational-fluid dynamics solvers (Mechanical Engineering projects), Matlab programming, as well as working with various optimization and modeling techniques



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EOMC website: http://www.ru.is/kennarar/koziel/eoml_index.html

