

## Innovation driven research education – The PIEp IDRE project

### *Why*

Postgraduate education is rigorously conducted and subject to both strict and efficient quality control processes, and obviously involves talented and creative people in a competitive environment. Still, the resulting level of innovation is not sufficient. Given this, the IDRE project hypothesizes that a change in the way engineering research education is initiated, planned and carried out will lead to substantially improved education system performance in terms of result utilization and innovation. Ultimately, the intrinsic curiosity and talent of the people involved should to a larger extent result in patents, products and business.

### *What*

The PIEp IDRE project will at full pace cover 5 research projects including 9 PhD students at 4 of the PIEp nodes. Half of those PhD students are/will be funded from the PIEp program and the others are co-funded through other resources. All students and their supervisors are following and contributing a brand new *Innovation Driven Research Education* process which puts equal priority on both science and innovation. Hence, a more demanding but also a more rewarding research education. The overall goals of the IDRE initiative over the lifetime of PIEp are to: (i) Create at least ten products and/or companies, (ii) develop and implement a new and sustainable research education concept, and (iii) apply innovation process research for monitoring, reflection, learning, improvement and validation of the IDRE concept. In this first round, the IDRE projects are all related to research on the borderline between medical, technical and clinical research. The research and innovation topics include haptic and VR surgery simulation aids, biomedical optics for human diagnostics, MEMS structures for biotech application, infrared based vision prostheses and the final topic is tentatively related to active balance prostheses.

### *How*

IDRE is implementing a new type and structure of *innovation driven* research education which for certain engineering domains has potential to ensure a sustainable alternative to the currently prevailing research education system. Within PIEp, this innovation of the research education system is strongly linked to *PIEp EDU* and to the *PIEp Research School*. Since *one* goal of an IDRE funded PhD student project is to actively promote patenting and build-up of spin-off companies IDRE will also utilize and contribute to *PIEp IMP*.

IDRE is managed by a project leader (Prof Jan Wikander) and supported by a steering group composed as follows: Professor Lars-Åke rodin, KTH/CTMH, Associate professor Martin Grimheden, PIEp EDU, Professor Hans von Holst, Karolinska Institutet, Professor Mats Leijon, Uppsala University, and Business coach Gösta Sjöholm, STING (Stockholm Innovation and Growth). All of the engaged external experts have substantial experience in talking research results to commercialization.

On top of the carefully selected research projects, IDRE will also work with:

- Supporting courses and literature. A textbook on innovation driven research with widely international co-authorship is currently under editing with a plan to publish during 2010.

- Framework and mechanisms for research student supervision and coaching by engaging all the student supervisors in a network and by occasionally engaging external experts and the steering group members.
- A creative activity towards finding additional funding schemes to facilitate the engagement of new students upon graduation of the current students.

The points above are of generic nature in the sense that we expect that other product domains, technology areas and actors (other departments, other universities...) also will adopt the concept of innovation driven research education. Not only do we foresee this, but the ambition is also to actively support such initiatives.

### *Projects*

Project	PIEp nodes	PI and supervisors	PhD students	Start	Half term evaluation	Finish
Medical diagnostics using spectroscopy	LTH	Sune Svanberg Katarina Svanber	Märta Lewander Mikkel Brydegaard	09-01-01	09-12-31	11-06-30
Restoring vision disorders through infra-red stimulation of the visual cortex	CTMH, KTH	Hans von Holst	Rickard Axelsson	08-09-01	10-02-28	12-08-31
Multiplex disease marker diagnostics based on the ISET platform	LTH, KTH	Thomas Laurell Sophia Hober	Recruiting now Recruiting now	09-12-01	12-05-31	14-11-30
Simulation of surgical procedures with haptic feedback	KTH, CTMH	Jan Wikander Hans von Holst Kjell Andersson	Magnus Eriksson Suleman Khan	09-10-01		11-03-31
TBD		Martin Grimheden Jan wikander				