Ultra-light weight design through Additive Manufacturing

Background
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Department of Industrial and Materials Science is hosting the competence center “Centre for additive manufacturing – metal (CAM²)” that involves broad network of national and international companies. Project will be done in collaboration between ABB corporate research in Västerås and IMS at Chalmers in the frame of CAM².

Description of the thesis work
Additive manufacturing opens up for many new exciting functionalities that can hardly be achieved by conventional manufacturing techniques.

The present master thesis will push the limits of additive manufacturing and aims at designing a floating metallic device.

The main characteristics of the component are:
- extremely low weight to volume ratio
- Sustain non-negligible static loads
- Corrosion resistant in different environments and might therefore be produced in different materials (polymer, stainless steel, Ti64, Inconel…)
- Typical size from 10 -50 cm long

The goal of the project is to evaluate the feasibility of using additive manufacturing techniques to produce this family of components.

The work should address the design and dimensioning of reinforced structure (e.g. lattice) to cope with the predefined loads. For this, advanced knowledge in CAD and FEM for structural design and an ounce of creativity might be required.

The second part of the work should challenge the existing manufacturing processes to produce this optimized structure. Although AM is the main candidate, other commercial manufacturing
techniques might be of interest. Ultimately, one component might be printed in polymer and Ti64.

Finally, the thesis should provide guidelines which technology and design are the most suitable for production of these parts.

Requirements:
We are looking for a master student with a profile towards material science. A solid background in additive manufacturing is an advantage.

Extent and time plan:
• Period (January-June 2019)
• Number of credits 30 ECTS/högskolepoäng(hp).
• The thesis is intended for one student

More information:
Recruiting Manager Santanu Singha, +46 21-34 51 72, will answer your questions. Union representatives - Sveriges Ingenjörer: Ulf Westblom +46 21 32 30 68. Unionen: Krista Andersson, +46 21- 34 02 85. Ledarna: Lenny Larsson +46 21-32 85 47. All other questions can be directed to Terese Björklund, + 46 21-32 80 75. Positions are filled continuously. Apply with your CV, academic transcripts and a cover letter in English

Welcome to apply!

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