

## FORM FOR EMPLOYERS

**INSTITUTION:** Lodz University of Technology (TUL), Institute of Applied Computer Science

**CITY:** Lodz (Poland)

**POSITION:** Early-stage researcher

**DISCIPLINE:** electrical engineering, computer engineering, control engineering, process engineering

**POSTED:** 18.09.2017

**EXPIRES:** 25.10.2017

**WEBSITE:** [www.tomocon.eu](http://www.tomocon.eu)

**KEY WORDS:** process tomography, sensors and actuators, batch crystallization, data processing and analysis.

**DESCRIPTION** (field, expectations, comments):

The European Marie-Sklodowska-Curie Innovative Training Network TOMOCON joins 12 international academic institutions and 15 industry partners. We work together in the emerging field of industrial process control using smart tomographic sensors. The network will lay the scientific and technological fundamentals of integrating imaging sensors into industrial processes and will demonstrate its functional feasibility on lab and pilot-scale applications. Our doctoral researchers will be trained and work in the fields of process tomography hardware, software and algorithms, control systems theory and design, industrial process design, multi-physics modelling and simulation, human-computer interaction, and massive parallel data processing. More information about the network and all open positions can be found on our web page [www.tomocon.eu](http://www.tomocon.eu).

Within TOMOCON we seek excellent open-minded and team-spirited PhD candidates who will get unique international, interdisciplinary and inter-sectoral training in scientific and transferable skills by distinguished leaders from academia and industry. Within the TOMOCON network we offer the following PhD position at TUL:

### **ERT TOMOGRAPHY FOR MEASURING THE CRYSTALLIZATION PROGRESS IN A BATCH REACTOR**

Reference number: TOMOCON-ESR11

3D ERT is an appropriate tomography modality to non-invasively measure the progress of crystallization in a batch reactor volume. The PhD candidate shall develop new generation of 3D ERT sensor that meets the requirements of batch processes (e.g. electrode immersion, large tank size, 3D measurement) and achieves maximum spatial resolution for monitoring and diagnosis of batch crystallization processes. This comprises formulation of a concept to compensate for temperature sensitivity as well as a concept for prevention of crystallization fouling on electrodes via heated electrodes. Special focus will be given to the development, implementation and configuration algorithms for fast volumetric quantification of crystal size distribution and solids concentrations. Finally, the expected result is to control actuators using ERT data in a feedback loop. The work includes fundamental scientific analyses, engineering design and technical demonstration together with group in Lappeenranta and different industry partners. The PhD candidate will realise secondments of few months for technical and scientific training at Sulzer AG (Switzerland), Chalmers University of Technology (Sweden), Technical University of Liberec (Czech Republic) and Lappeenranta University of Technology (Finland). The PhD degree will be awarded by the Lodz University of Technology in Poland.

**Requirements**

- Distinct university graduation - MSc in engineering, preferably in electrical, computer or control engineering, or in a closely related area
- Very good skills in programming
- Strong mathematical skills
- Experience in measurement, sensor technology and process modelling
- Strong interest in interdisciplinary scientific work
- Good proficiency in English language both in speaking and writing

**Starting Date** 1<sup>st</sup> March 2018

**Contract** Full-time contract for 36 months

**Salary** The Marie Skłodowska-Curie programme offers highly competitive and attractive salaries. Gross and net amounts are subject to country-specific deductions as well as individual factors and will be confirmed upon appointment.

**Information** Dr. hab. Lidia Jackowska-Strumiłło, Prof. of TUL - Primary Supervisor  
**Application** Please submit via email your application (cover letter, CV, certificates) to the Primary Supervisor with indication of the position reference number TOMOCON-ESR11

**Eligibility:** *The candidate recruited in the TOMOCON project must be Early-Stage Researcher (ESR) and undertake transnational mobility (secondments, trainings, conferences). The candidate must be in the first four years from the date when the researcher obtained the degree entitling him or her to embark on a doctorate (e.g. master degree). It will be counted backward from the date of recruitment (in this case 01.03.2018). No doctoral degree has been awarded during these four years. The candidate can be of any nationality. The candidate must not have resided or carried out her/his main activity (work, studies, etc.) in Poland for more than 12 months in the 3 years immediately before the recruitment date. Compulsory national service, short stays such as holidays, and time spent as part of a procedure for obtaining refugee status under the Geneva Convention<sup>1</sup> are not taken into account.*