BATWOMAN

Basic Acoustics Training - & Workprogram On Methodologies for Acoustics - Network

OPEN POSITION AT "VIRTUAL VEHICLE" IN THE FIELD CHARACTERISATION OF VEHICLE EXHAUST ORIFICE NOISE BY ADOPTING THE MUSICAL ACOUSTICS ANALOGY

BATWOMAN (**B**asic **A**coustics **T**raining - & **W**orkprogram **O**n **M**ethodologies for **A**coustics - **N**etwork) is the **Initial Training Network (ITN)** No. 605867, funded under the FP7 Marie Curie programme of the EC. **Duration:** Sep. 1, 2013 - Aug. 31, 2017.

BACKGROUND: The BATWOMAN ITN aims at structuring research training in basic and advanced acoustics and setting up a work program on methodologies for acoustics for skills development in a highly diverse research field offering multiple career options.

The consortium consists of renowned public and private partners from musical acoustics, room acoustics and automotive acoustics who will merge their existing knowledge, extend it jointly and complement it with insights of recent sound perception research, (Fig. 1.) This will exploit existing synergies and overcome obvious fragmentation in research, methodology and basic as well as advanced acoustics training.

Providing interdisciplinary training and joining or exchanging methodology in research, is expected to have a strong impact on the skills of trained researchers as far as sound design capabilities, modelling accuracy, efficiency and applicable frequency range is concerned. Adding the understanding of human auditory perception will help to tackle the hard problem of sound quality parameters and to better understand stimulating effects on well-being and cognition of people exposed to sound, but also harmful effects, like annoyance or even deteriorating cognitive performance.

The ITN will provide interdisciplinary and intersectoral research training for excellence. It will structure existing PhD-level training in acoustics setting up European curricula with compatible and recognised courses offered by Universities and private enterprises. Simultaneously it will push the state of the art in vibro-acoustic modelling and in interdisciplinary design optimisation by initiating a joint research effort increasing critical mass. The complementary structure of the network will make it not to break apart after the ITN project period. It is rather expected that the methodologies used to analyse, design and optimise transport vehicles, rooms and musical instruments will grow together and will be further developed in an interdisciplinary joint effort.

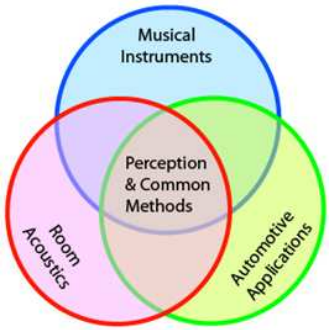

Fig. 1: BATWOMAN R&D scope.

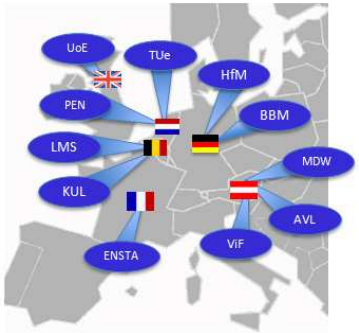

Fig. 2: BATWOMAN consortium.

CONSORTIUM: contains partners (6 universities, 1 research institutes and 4 companies) specialised in three specific application fields of acoustics: Automotive sector, room acoustics and musical instrument acoustics, see Fig. 2. The industrial partners bring in application knowledge and expertise, and the research partners bring in a range of engineering methodologies, the capability of PhD research training, provision of courses and dissemination of results.

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COORDINATOR: ViF - Kompetenzzentrum - Das virtuelle Fahrzeug Forschungsgesellschaft mbH, http://www.v2c2.at/ in Graz, Austria. BATWOMAN Coordinator: **Martin Wifling**, Martin.Wifling@v2c2.at

MARIE CURIE ELIGIBILITY CRITERIA – in short:

- **Early-Stage Researcher (ESR):** holds an MSc degree in Engineering and has less than 4 years of experience and has not yet been awarded a doctoral degree[1].

Within BATWOMAN, ViF (www.v2c2.at) is looking for an ESR (Duration 36 months) focusing on
"Characterisation of vehicle exhaust orifice noise by adopting the musical acoustics analogy"
Motivation: In specific load conditions, automotive exhaust system and in particular the orifice noise is a dominant noise source. Due to the distinctive directivity characteristics and its distributed source behaviour, the characterisation of the orifice noise is however not a straightforward task. Industry is seeking for simplified approaches to identify this type of noise source.

Objectives/Tasks:

1. understand and characterise the radiation properties of an automotive exhaust pipe orifice
2. exploit the synergy between the automotive (exhaust pipe/orifice) and musical acoustics (flute)
3. spherical holography on pipe/flute to capture the radiation pattern
4. time-reversal analysis – time history signals acquired during the spherical holography will be used for a time-domain simulation; this allows to track the wavefront of the envelope propagating inwards the sphere in order to reconstruct the acoustic origin of the source
5. modelling of the orifice/flute by a reduced set of elementary sources (source synthesis technique)
6. effects on the sound propagation due to the vortex sheet of mean flow, modelling

CANDIDATE PROFILE: All candidates must be fluent in spoken and written English. The R&D is highly multidisciplinary. An ideal candidate has an M.Sc. in engineering (e.g. mechanics, materials, electronics, physics) and an adequate technical background.

- Knowledge of vibro-acoustics is highly welcome
- Knowledge of MATLAB is a must, other programming languages welcome
- Specific experience with CAE simulation methodologies and software tools is an advantage
- Affinity with vehicle engineering is an asset
- All members of the network are equal opportunity employers, both female and male candidates are invited to apply.

The research activities will mainly be carried out at Partner ViF located in Graz, Austria combined with a short-term secondment to University of Music and Performing Arts Graz (KUG).

APPLY NOW! Expected starting date: from March 1 till June 1, 2014

APPLICATION: To apply, please send a **detailed CV** together with a **letter of motivation, full list of grades and credits from the BSc/MSc study** and **names of reference(s)** to

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Virtual Vehicle
Inffeldgasse 21A
8010 Graz
AUSTRIA

The remuneration will be in line with the EC rules for Marie Curie grant holders and consists of a salary augmented by a net mobility allowance. http://cordis.europa.eu/fp7.

[1] The research experience includes the period since gaining a university degree giving the candidate access to doctoral studies (the degree must entitle the holder to embark on doctoral studies, without having to acquire any further qualifications) or already in possession of a doctoral degree, independently of the time taken to acquire it. Among others, following criteria apply for eligibility:

- the researcher shall not be a national of the State in which the hosting partner's research team is located
- at the time of appointment, the researcher may not have resided or carried out her/his main activity in the country of the hosting partner for more than 12 months in the 3 years immediately prior to her/his appointment
- women are especially encouraged to apply.