



Novel advances in mechatronics: development and application of radically novel time –frequency signal processing to complex electro-mechanical systems

Lecturer: Prof. Len Gelman (Cranfield University, UK)

Course description:

The lecture will give an overview of current state-of-the-art of signal processing technique that is employed for complex mechanical systems: turbines, The lecture will describe the radically novel time-frequency second order and the higher order signal processing technique that was proposed by Visiting Professor, developed by him in collaboration with his Cranfield's colleagues and successfully applied in multiple EU projects (for wind turbines and civil engineering structures) and for the following customers: Rolls-Royce, Boeing, Shell, SKF, Scottish Energy, ERIKS, Dresser-Rand and London Underground. In particular, the novel wavelet bicoherence and tricoherence, the novel chirp Fourier bicoherence and tricoherence, the chirp Wigner bicoherence and tricoherence and the novel non-stationary spectral correlations will be described. The novel applications and experimental validation of these techniques via simulation, laboratory and in-field testing will be also described.

Syllabus of the lecture

1. State-of-the-art
2. The radically novel time-frequency second order signal processing techniques
3. The radically novel time-frequency higher order signal processing techniques
4. Validation of the proposed techniques by numerical simulation
5. Validation of the proposed techniques by in laboratory experiments
6. Validation of the proposed techniques by in-field trials
7. Industrial application of the proposed techniques

TERMINY WYKŁADÓW			
Data	Dzień tygodnia	Godzina	Sala
2015-01-13	Wt	9.15-14.00	EiA E28
2015-01-14	Śr	8.15-14.00	EiA E28
2015-01-15	Cz	8.15-12.00	EiA E28