



Advancement In Speech Modeling And Applications

Monday, 22nd – Sunday, 28th, Jan 2018

Department of Electronics and Communication Engineering, NIT Warangal

Overview

Speech is the most natural form of human-human communications. Speech is related to language, human physiological capability, sound and acoustics. Therefore, speech is one of the most intriguing signals that humans work with every day. The speech production takes place under the controlled cognitive guidance. The production apparatus consists of vocal tract system having flexibility due to articulators and at the same time has some inertia. Based on short term processing, several methods have been proposed in the literature including short term Fourier transform, cepstral analysis, linear prediction analysis and sinusoidal analysis. The short-term Fourier transform is the modified version of Fourier transform using window functions for analyzing non-stationary signals like speech. The cepstral analysis is based on source system separation by performing nonlinear operation in the frequency domain. The linear prediction analysis involves source-system separation based on prediction process. The sinusoidal modeling is based on estimating amplitude, frequency and phase values of set of sine waves. All these methods are on the assumption of short term stationarity. The advanced sinusoidal modeling is the modified version of conventional sinusoidal modeling based on the motivation to minimize the effect of assumption of short term stationarity. The conventional sinusoidal modeling will have a set of sine waves whose frequency and/or amplitude are constant. In general, the adaptive sinusoidal is based on the principle of projecting a signal segment onto a set of non-parametric, time-varying, non-stationary set of sinusoidal basis functions inside an analysis window. The sinusoidal modeling has found widespread applications in the domains of speech and audio processing. The primary application of sinusoidal modeling is in speech and audio analysis. Stressed speech analysis and recognition, speech classification, voice transformation and synthesis are other applications. The course will explain in detail about these applications and future trends of these applications.

In this regard, it is decided to invite Prof. Yannis Stylianou from the University of Crete, Greece, Department of Computer Science, Greece, to have discussions and deliver lectures on advancement in speech modeling and applications. Course participants will learn these topics through lectures and hands-on experiments. Also, case studies and assignments will be shared to stimulate research motivation of participants.

Modules	Advancement In Speech Modeling And Applications : Jan 22 - Jan 28 2018 Number of participants for the course will be limited to fifty.
You Should Attend If...	<ul style="list-style-type: none"> ▪ Faculty members working in engineering colleges interested in Speech Signal Processing. ▪ Executives, engineers and researchers from manufacturing, service and government organizations including R&D laboratories. ▪ Student and research scholars with research interest in Speech Signal Processing from reputed academic institutions and technical institutions.
Fees	<p>The participation fees for taking the course is as follows:</p> <p>Faculty and scientists: Rs 2000/-</p> <p>Participants from industry/ Training organizations/ consultancy firms: Rs 4000/-</p> <p>Students and research scholars</p> <ul style="list-style-type: none"> • Without award of grade : Rs 500/- • With award of grade : Rs 1000/- <p>Student participants from abroad : USD 50</p> <p>Other participants from abroad : USD 100</p> <p>The above fee includes all instructional materials, computer use for tutorials and assignments, laboratory equipment usage charges, 24 hr. free internet facility. The participants will be provided with accommodation on payment basis.</p>

The Faculty



Prof. Yannis Stylianou is Professor of Speech Processing at University of Crete, Greece, Department of Computer Science, CSD UOC, and Group Leader of the Speech Technology Group at Toshiba Cambridge Research Lab, UK. Until 2012, he was also Associate Researcher in the Signal Processing Laboratory of the Institute of Computer Science ICS at FORTH. During the academic year 2011-2012 was visiting Professor at AHOLAB, University of the Basque Country, in Bilbao, Spain (2011-2012).

He received the Diploma of Electrical Engineering from the National Technical University, N.T.U.A., of Athens in 1991 and the M.Sc. and Ph.D. degrees in Signal Processing from the Ecole Nationale Supérieure des Telecommunications, ENST, Paris, France in 1992 and 1996, respectively. From 1996 until 2001 he was with AT&T Labs Research (Murray Hill and Florham Park, NJ, USA) as a Senior Technical Staff Member. In 2001 he joined Bell-Labs Lucent Technologies, in Murray Hill, NJ, USA (now Alcatel-Lucent). Since 2002, he is with the Computer Science Department at the University of Crete while since January 2013, he is also with Toshiba Labs in Cambridge UK. His current research focuses on speech signal processing algorithms for speech analysis, statistical signal processing (detection and estimation), and time-series analysis/modeling. He has coauthored more than 150 scientific publications, and holds 15 UK and US patents, which have received more than 4400 citations (excluding self-citations) with H-index=30. He co-edited the book on “Progress in Non-Linear Speech Processing”, Springer-Verlag, 2007. He has been the P.I. and scientific director of several European and Greek research programs and has been participating as leader in USA research programs.



Dr. T. Kishore Kumar is an Associate Professor in the Department of Electronics and Communication Engineering, National Institute of Technology, Warangal, Telangana, India. From 1999 he was associated with NIT Warangal in the position of Assistant Professor and became Associate Professor in 2006. Presently, he is a member of Andhra Pradesh State Council of Higher Education (APSCHE). He was awarded Research Excellence Award-2017 by Institute for Exploring Advances in Engineering (IEAE) for his research work titled “An iterative posterior NMF method for speech enhancement in the presence of additive

Gaussian noise” published in Neuro Computing (March 2017). In recognition of his outstanding research, consultancy and training in the field of Electronics & Communication Engineering, National Institute of Technology, Warangal and NITW Alumni Association has presented Dr. T. Kishore Kumar with the Best Engineering Researcher Award – 2017. He has contributed substantially to the laboratory innovations and qualitative research endeavors in the department. His current areas of research include Speech Signal Processing, Adaptive Signal processing etc. He has completed two DRDO projects worth 18 Lakhs and one MHRD, NMEICT pedagogy project worth 7 lakhs received two major research projects sponsored by SERB worth 60.78 Lakhs. Besides this, he also has two SERB projects worth 47 Lakhs and 25 Lakhs as co-investigator. Over the past decade and half, he has taught several courses at UG and PG levels at NIT Warangal. Under his amiable guidance Four scholars have been awarded PhDs and Three scholars have submitted their PhD synopsis. At present Six PhDs are guided by him. He has also guided over 22 M.Tech and 30 B.Tech students. He has published 21 international journals and 17 international conferences during the last five years. Dr. T. Kishore Kumar has travelled across many countries like Czech Republic, France, Israel, Singapore, Dubai, Estonia for academic purposes. He has organized several Faculty Development programs in the domains of Speech Signal Processing, Signal Processing and Real Time Embedded Systems at NIT Warangal and outside. He has coordinated MHRD initiated GIAN course on ‘Biomedical Signal Analysis’ in 2016.

One week GIAN Course On Advancement in Speech Modeling and Applications

Jan 22 - Jan 28, 2018

Course Coordinator:

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