

In This Issue. . .

- **Illustration:** Phase Response of Different types of systems
- **On going Research Work:** Current research works in PRCI Lab.

Dear friends! **COMPSIG NITT** is a monthly newsletter to share the research work done in the Pattern recognition and computational intelligence laboratory, Department of Electronics and Communication Engineering, National Institute of Technology Trichy.

Concepts, Ideas pertaining to Computational intelligence, Pattern recognition and Signal processing are also included in this newsletter.

We expect the feedback, comments and articles from you all.

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Illustration

Fig.1(a): System I (cascade of 10 systems each having one zero within the unit circle)

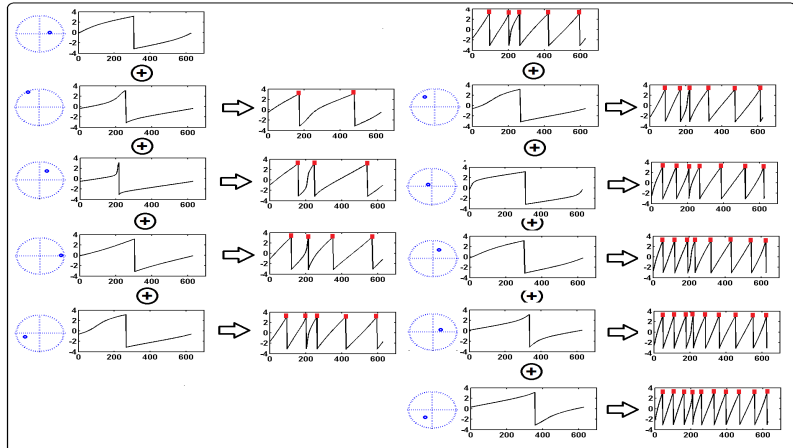
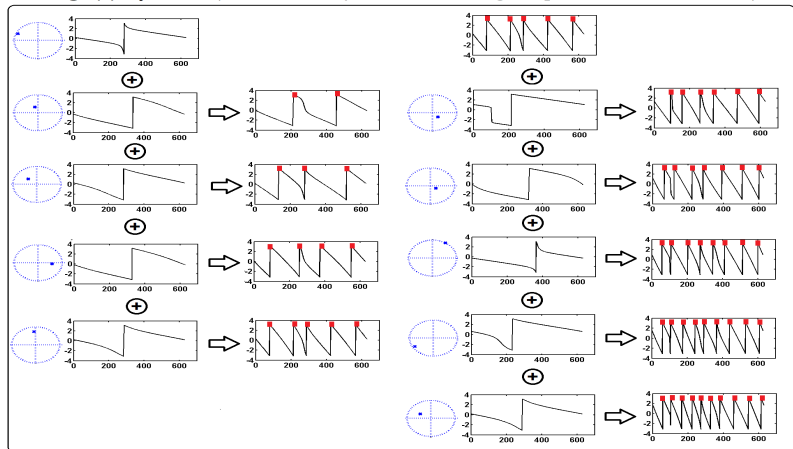


Fig.1(b): System II (cascade of 10 systems each having one pole inside the unit circle)



The phase response of four different types of systems are shown in Fig.1((a)-(d)). Fig. 1(a) demonstrates the pole-zero plot, corresponding phase response and the cumulative summation of the phase responses of system I. Since the phase response is additive in nature, it is seen that the number of transitions in the cumulative phase response is equal to the number of zeros. Similarly, Fig. 1(b),1(c) and 1(d) demonstrate the phase response for system II, system III and system IV respectively. The cascade of two different types of systems is shown in Fig.2. The transitions are seen only in the cascade of system I-system IV (Fig. 2(c))and cascade of system II-system III (Fig. 2(d)) where either all zeros are inside the unit circle and poles outside the unit circle or vice versa. This technique is exploited in finding the line spectral frequency in speech processing.

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Fig.1(c): System III (cascade of 10 systems each having a pole at the origin and a zero outside the unit circle)

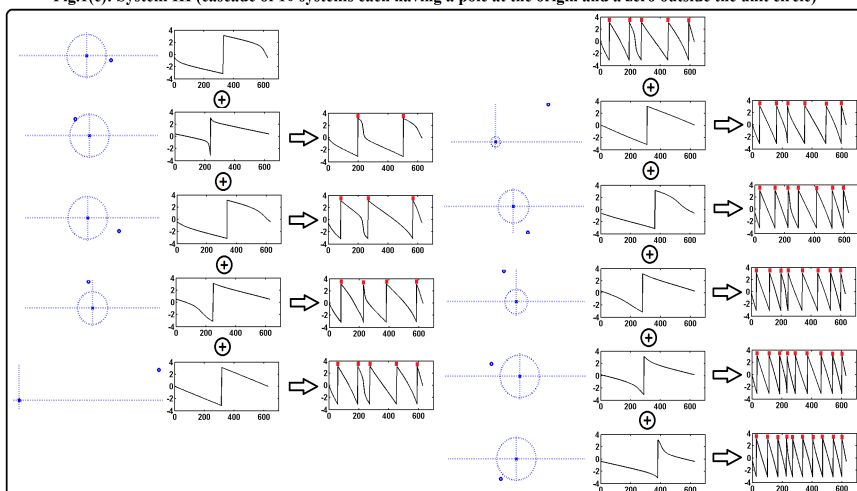


Fig.1(d): System IV (cascade of 10 systems each having a zero at the origin and a pole outside the unit circle)

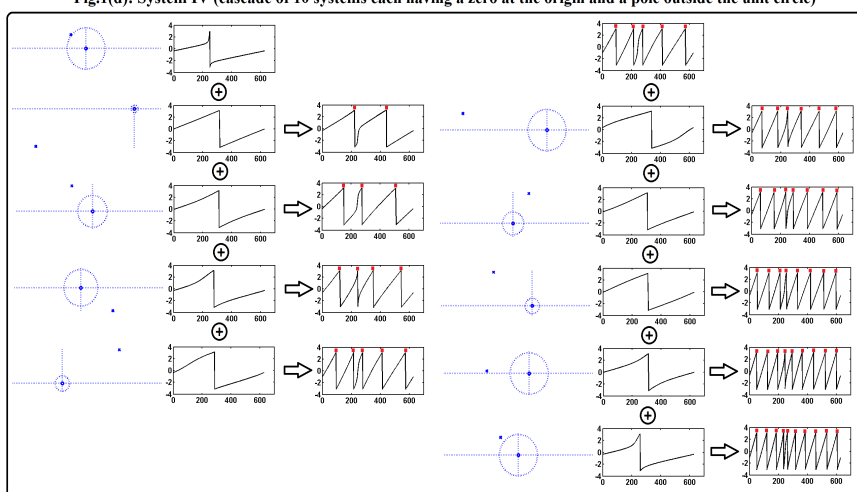
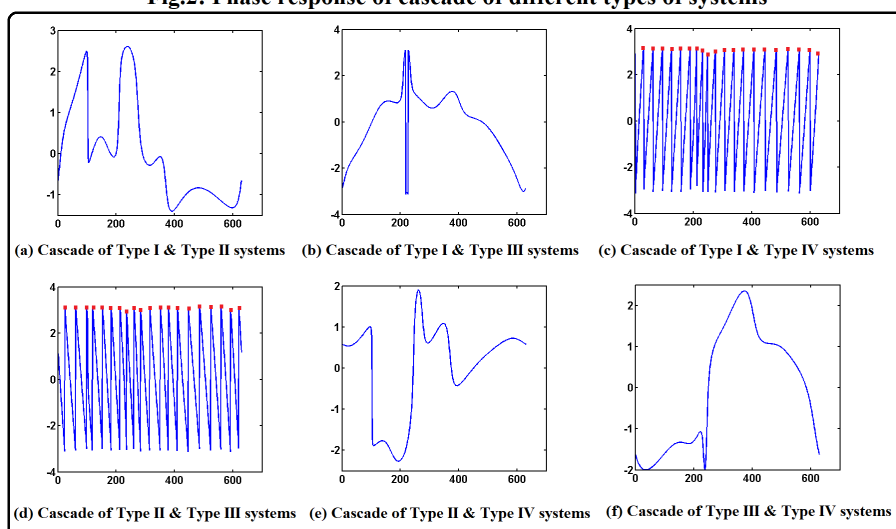


Fig.2: Phase response of cascade of different types of systems



On-going Research

- Constructing a Sunflower plant database and perform off-type identification using morphological features.
- Application of machine learning techniques in next generation wireless communication.
- Classification of Music composition styles using probabilistic generative model
- Computational intelligence for transmit power control policy of Energy Harvesting Sensors
- Estimation of Primary User Parameters in Cognitive Radio using Computational Intelligence

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Feedback

COMPSIG NITT invites articles and innovative ideas from readers for the [Reader's Space](#) column. We expect feedback and comments to monthly newsletter [COMPSIG NITT](#). Readers can share their views in our facebook page, "[COMPSIG-NITT](#)". Those who are interested can be a part of the facebook group.

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For further details see to the following pdf: [Link to the pdf file](#)
Link to the m-file: <http://silver.nitt.edu/esgopi/mfiles/phaseresponse/>

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Quotes

"Great dreams of great dreamers are always transcended." — Dr. A.P.J.Abdul Kalam