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This special issue of IEEE SIgnal Processing Magazine is divided into two parts (part 2 will appear in the September issue the magazine). The goal of both parts of the special issue is to show, in the typical rigorous but easy-to-understand style of the magazine, the main techniques applied in different scenarios by different systems, focusing particularly on some of the new civil and commercial applications. This issue includes eight special issue articles as well as two interesting feature articles. Happy reading!

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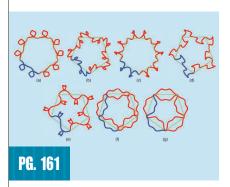
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