

By
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Platform-based design in the year 2020

About the author

As a director for TI's Communications Systems Laboratory, Don Shaver has been with TI for over 30 years managing leading-edge technology development initiatives in TI's R&D organizations. He is also a TI Fellow and holds 11 patents.

Platform-based design is an IP reuse strategy that facilitates the rapid creation and verification of SoC designs containing sophisticated IP originating from different sources. Ideally, as a particular technology becomes more refined and mature, the non-differentiated aspects of its implementation can be automated, freeing designers to devote their time to value-added design. Through automation of the complex, tedious and error-prone steps in the creation, integration and verification of IP, technology can mature more quickly and migrate to other applications.

Multi-core SoC designs will be pervasive with high-performance engines supporting an order of magnitude more MACs by 2020. Despite architectural innovations, however, front-end computations will continue to outpace programmable processor capabilities, leading to an increased need for standard accelerators, especially for communications and multimedia applications.

Technology, however, is driven by the applications that pay for it. In order to understand the world of 2020, one must look at the software and hardware components of today's designs and project how these components will be expanded upon, extended to other applications and abstracted so that their complexity is masked from developers.

- **Video analytics:** Video analytics include video-processing features such as object recognition and tracking. Given their usefulness in a wide range of applications, video analytics will become fully standards driven as well as eventually embedded in every DVD player, recorder, set-top box and portable player. Software programmability is required so that hardware resources can be leveraged across multiple analytics.
- **Wireless HD (60 GHz) and Wireless HDMI:** The ability to reliably transport HD video will lead to the elimination of cables within the video market. Coexistence and reliability with other wireless technologies will be sufficiently resolved. RF, MAC and PHY components will be commodities. Time-to-market pressures will be intense.
- **3D Displays/3D Video Compression:** Advances in stereoscopy, autostereoscopy and holography will be the new frontiers for digital video, leading to a whole new class of video algorithms and accelerator technology.

- **More video and audio compression standards:** Whether higher compression ratios will bring higher quality or not, they will increase content availability to consumers, and therefore increase desirability of multimedia functionality in all consumer devices.
- **Intelligent highway systems:** Support for intelligent highways will be required in all urban areas by 2020. While standards driven, it will be important for systems to utilize a programmable DSP to support machine vision, GPS, real-time notifications and detours.
- **GPS:** In addition to being integrated into every vehicle to support intelligent highway systems, GPS will be in every consumer device. Because data streams will be personalized for location-based services, as compared to multicast or broadcast, this will significantly increase network usage.
- **Medical:** A clear driver for high-performance processors, applications such as ultrasound, MRI equipment and 3D displays will be key growth areas. Standard sensor interfaces will arise, as will disposable wireless sensors and the “body area network” for hospital patients.

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