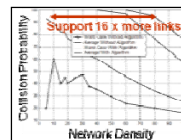


CRT is the Right Development Partner for Your Cognitive Radio Solution

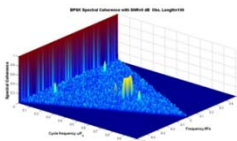
With TV White Space standards finalizing (e.g., 802.11af, 802.16h, 802.22, and CogNeA) and cognitive radio techniques appearing in unlicensed and licensed products (e.g., interference avoidance and self-organizing networks), cognitive radio is an increasingly important part of a wireless product. Cognitive Radio Technologies, LLC (CRT), a 2007 spin-out from Virginia Tech, was founded with the mission to help transition cognitive radio from the laboratory to the market. By making use of CRT's engineering services, your business can gain a competitive advantage by incorporating cognitive radio techniques into your product line for greater reliability, enhanced performance, and faster deployment.



Unsurpassed Technical Expertise

CRT combines both the algorithm research capabilities and hardware implementation expertise needed to make your product a reality.

Research Excellence



CRT has the breadth and depth of knowledge to apply existing techniques to solve your problem and to develop new algorithms when needed. With collectively hundreds of papers on the research and design of cognitive radio (including x award winning papers), CRT's academic roots and expertise is evident across all layers of the wireless stack and in all aspects of cognitive radio as recognized leaders in signal detection and classification (e.g., cyclic spectral analysis, cumulant methods), interference avoidance and mitigation techniques, machine learning for wireless communications (e.g., inverse reinforcement learning, Q-learning, neural networks, hidden Markov models, Kalman filtering), game theory (potential games, adversarial game theory, mechanism design) and more.

Practical Development

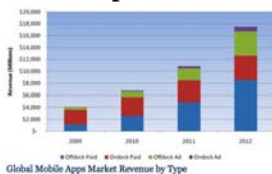
CRT goes beyond academic research to develop fully functional prototypes to test, validate, and refine the design for assured operation with your product. With experience working with mixed FPGA / DSP / microprocessor platforms as well as smart phones and massive multi-core supercomputers, CRT can deliver the solution in the form that best suits our customers' needs: HDL for an ASIC or FPGA implementation, embedded C or assembly for a DSP or micro, fourth generation object-oriented service-oriented architecture for high-end solutions, or just MATLAB, NS2 or OPNET simulation code when that is all the customer needs. With our deep and broad understanding of cognitive radio techniques, we have the flexibility to apply the latest and most sophisticated algorithms when performance is paramount or less complicated solutions when cost and power are the top concerns.



Customer Focused Design

By treating our customers as development partners, CRT simplifies technology transition and reduces time to market.

A Development Partner, Not Just a Service Provider



CRT views our customers as partners and their success as our success; thus we strive to ensure our customers' products are successful in the marketplace. We begin the development process by first understanding the immediate needs and longer term vision of our partners to ensure that the solutions we deliver are the solutions our partners need. To ensure successful technology transfer, we work side-by-side with our partners throughout the development process – at their facilities or ours – so our partners have an intimate understanding of the solution well before final handoff. Throughout the development process, we draw on CRT's participation in and chairing of several cognitive radio related industry groups and CRT's internal market studies to work with our partners to assess and improve the competitive positioning of their products.

Reduced Time to Market

CRT recognizes that being first to market can be every bit as important as having the right technology, and CRT is committed to meeting our customers' timelines. With our intimate knowledge of all aspects of cognitive radio, our experienced core team can immediately begin the development process in contrast with other academic and industrial institutions that would require a long time to bring their students or employees up to speed on the technology. For larger efforts with compressed timelines, CRT will augment its staff with experienced programmers and developers drawn from our contacts in the cognitive radio community that can immediately contribute under the direction of the core CRT team. Further, CRT recognizes that time lost to contract negotiations is time lost getting to market. Without a contract bureaucracy to navigate, with experience with a wide variety of contract vehicles that allows CRT to work within the structure that best suits our partners' needs, and is open to the stance that all new IP developed under funding from our partner should belong to our partner, CRT typically completes contract negotiations in hours instead of the months normally required for universities or businesses.

