Project Brief

Open Competition 2 - Electronics and Photonics (July 2002)

Low-Cost Flexible Plasma Displays

Develop a novel plasma display panel structure that uses hollow glass microspheres containing ultrapure ionizable gas as the addressable pixel elements, uses a flexible substrate, and substantially lowers the cost of displays.

Sponsor: Imaging Systems Technology

4750 W. Bancroft Street
Toledo, OH 43615-3902

- Project duration: 7/1/2003 - 6/30/2006
- Total project (est.): $2,861,868.00
- Requested ATP funds: $1,999,192.00

Plasma display panel (PDP) technology is preferred for large-area and high-definition displays, such as those used in stadiums. PDPs are bright, offer high contrast and wide viewing angles, and are relatively thin, but at $200 per diagonal inch, they are far too expensive for many applications. With a Small Business Innovation Research grant from the National Science Foundation, Imaging Systems Technology (IST) developed a proprietary process to produce Plasma-spheres^{TM} (hollow glass microspheres containing ultrapure ionizable gas), attached them to an ordinary rigid substrate, and lit them with standard PDP electronics. Under this ATP project, IST proposes to develop a novel PDP structure combining Plasma-spheres^{TM} as the addressable pixel elements with a flexible substrate. Because the microspheres contain the pressurized gas, this technology eliminates the two rigid glass substrates needed to form an airtight seal in conventional displays, making Plasma-sphere displays lightweight. The inherent strength of the microspheres and the nature of the substrate also will make these PDPs extremely rugged. Whereas current PDPs require costly batch production, this new technology will permit low-cost, high-yield continuous production. IST will develop production processes and build monochrome and color proof-of-concept prototypes. EISC, Inc. (Toledo, Ohio), a subcontractor, will develop a fluidizer and particle-delivery system, coat the microspheres with the fluidizer, and assist with print-head development. This three-year project has high technical risk because it requires using unconventional materials and processes and applies principles gleaned from a wide array of dissimilar disciplines. Difficulties include developing a cell structure radically different from state-of-the-art PDPs, a suitable substrate, and new production equipment and processes. ATP funding is needed to produce functional prototypes, which are necessary to obtain investments to develop commercial products. Because microsphere

PDPs will last longer and be much cheaper ($25 to $50 per diagonal inch), this technology should open new markets and should help the nation recapture PDP production that has gone overseas. Ultimately, this technology should result in PDPs suitable for training and simulation systems, dynamic signs, stadium displays, and home theaters. Additionally, gas-filled microspheres coated with microparticles could have medical and industrial uses, as well.

For project information:

Vicki Kurtz, 419-536-5741
vkurtz@teamist.com

ATP Project Manager

Carlos Grinspon, (301) 975-4448
carlos.grinspon@nist.gov