Mitsubishi Electric Research Labs (MERL) 20th Anniversary

- **Generalized Belief Propagation**
  - Fundamentally improved Belief Propagation algorithm that provides more accurate results with fewer convergence problems.

- **Zigbee Ad-hoc Networking**
  - Pioneering ad-hoc network research adopted by the Zigbee low cost, low power, wireless network standard.

- **Sports Highlights Playback**
  - First automatic sports highlights video playback system.

- **IEEE 802.15.4a UWB**
  - Ten key technologies adopted by the impulse radio based, IEEE 802.15.4a, Ultra Wide Band (UWB) standard (and first precise localization system using that standard).

- **SAR Compression**
  - Novel scheme for data reduction of Synthetic-Aperture Radar (SAR) data that maintains reconstruction quality.

- **“MidAir”**
  - Simple and easy to use middleware supporting high-speed, network-based, distributed real-time systems such as factory automation systems.

- **“Concordia”**
  - World-class middleware for collaborating mobile agents.

- **Fast SVD**
  - Extremely fast incremental approximate Singular Value Decomposition (SVD) usable on Incomplete and Uncertain data.

- **Face Detection / Recognition**
  - First real-time face detection algorithm later extended to face recognition.

- **Analogy Logic**
  - Pioneering analog ASIC circuits that perform calculations simultaneously done by digital circuits, while using much less power.

- **“Spoken Query”**
  - Pioneering voice search technology applied to music search.

- **Diamond Park**
  - First distributed virtual environment allowing multiple geographically separated users to speak to each other and arbitrarily extend the virtual environment at runtime.

- **HDTV Decoder chip**
  - Key parts of the first ASIC chip set capable of decoding US HDTV signals.

- **Real-time Volume Rendering**
  - ASIC chip that is the first system capable of rendering volume data (e.g., from a CAT scan machine) in real time.

- **“Diamond Touch”**
  - First touch surface that allows multiple people to use their bare hands in simultaneously interact with the surface without interfering with each other.

- **“Saftrun”**
  - Best system for rendering high-quality scalable type on digital displays released to 500 million PCs in Flash.

- **3GPP LTE**
  - Eleven key technologies adopted by the 3rd Generation Partnership Project (3GPP) Long Term Evolution (LTE) cell phone standard.

- **3D Modeling**
  - Highly accurate Numerical-Control (NC) milling machine simulator based on MERL’s Adaptively-sampled Distance Fields that has low computational requirements.

- **Multi-View Video**
  - Innovative multi-view video coding research adopted by the H.264/AVC standard (which is the 3D format for Blu-ray discs).