New high-level algorithms*

**Optical Flow**
- Good Features To Track (3x)
- PyrLK (6-7x)
- Farnerback (6x)
- TV-L1 [2] (4x)

**Detectors**
- LBP for face detection (7x)
- Pedestrian detection via Soft Cascade (6x)**

**Super Resolution**
- Bilateral TV-L1 [4] (5-7x)

**Background Subtraction**
- FGD (3x)
- MOG (10-20x)
- MOG2 (10-20x)
- GMG (15-30x)
- VIBE (GPU only) [5]

**Image Processing**
- Hough Transform:
  - lines (20-30x)
  - segments (4-8x)
  - circles (8-20x)
  - general [1] (13x)
- NLM Denoising (20x)

**New functionality**

**CARMA support**
- GPU-accelerated ARM-based system
- NVIDIA® Tegra® 3 Quad-core ARM CPU
- Quadro® 1000M GPU with 96 CUDA cores
- Combines high-performance and energy-efficiency
- Economical, efficient, and scalable system
- GPU acceleration for CV on CARMA:
  - Optical Flow (5-40x)
  - Image pyramids (10-40x)
  - Color conversions (10-50x)
  - Filtering (20-70x)

**Optimization for Kepler architecture (2x)**
- All reductions (norm, minMax, countNonZero, etc) via warp shuffle instructions
- All per-element operations (add, divide, absdiff, etc) via video SIMD instructions

**GPU Video encoding & decoding**
- Wrappers for NVcuvid library

**OpenGL support**
- Mapping OpenGL objects to GpuMat
- imshow for GpuMat without memory transfers

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* Performance numbers were measured for NVIDIA GeForce GTX 670 and Intel Core i5-3570K 3.4 Ghz (4 cores)