ArcSoft Multi-Frame Technologies
Hot Chips 2012

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Advanced Imaging Technologies

ArcSoft Overview

- **Founded in 1994**

- **HQ in Fremont, CA**

- **900+ employees worldwide**

- **Photo & Video software**

- **Markets served:**

 **Mobile, tablet, PC, DSC**

# Industry Leaders Choose ArcSoft

ArcSoft Imaging Technologies

- **Adopted by major camera phone vendors and digital camera vendors**

- **Leverages various forms of hardware capabilities**
  - CPU, GPU, DSP, ISP, H/W Codec, Fast RAM, DMA, and other specialized hardware
  - Highly efficient ISP

- **Boosts value to the end product**
  - Better capture quality and speed performance
  - Better user experience
  - Differentiation
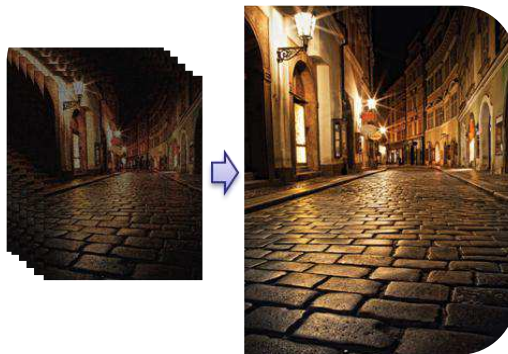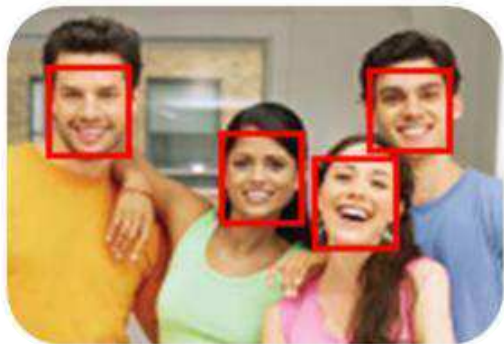
# ArcSoft Multi-Frame Technology Overview

- **Takes advantage of high speed burst capability in latest capture SOC**
- **Combines multiple image frames to achieve improved image quality and better experience**

ArcSoft Multi-Frame Technologies
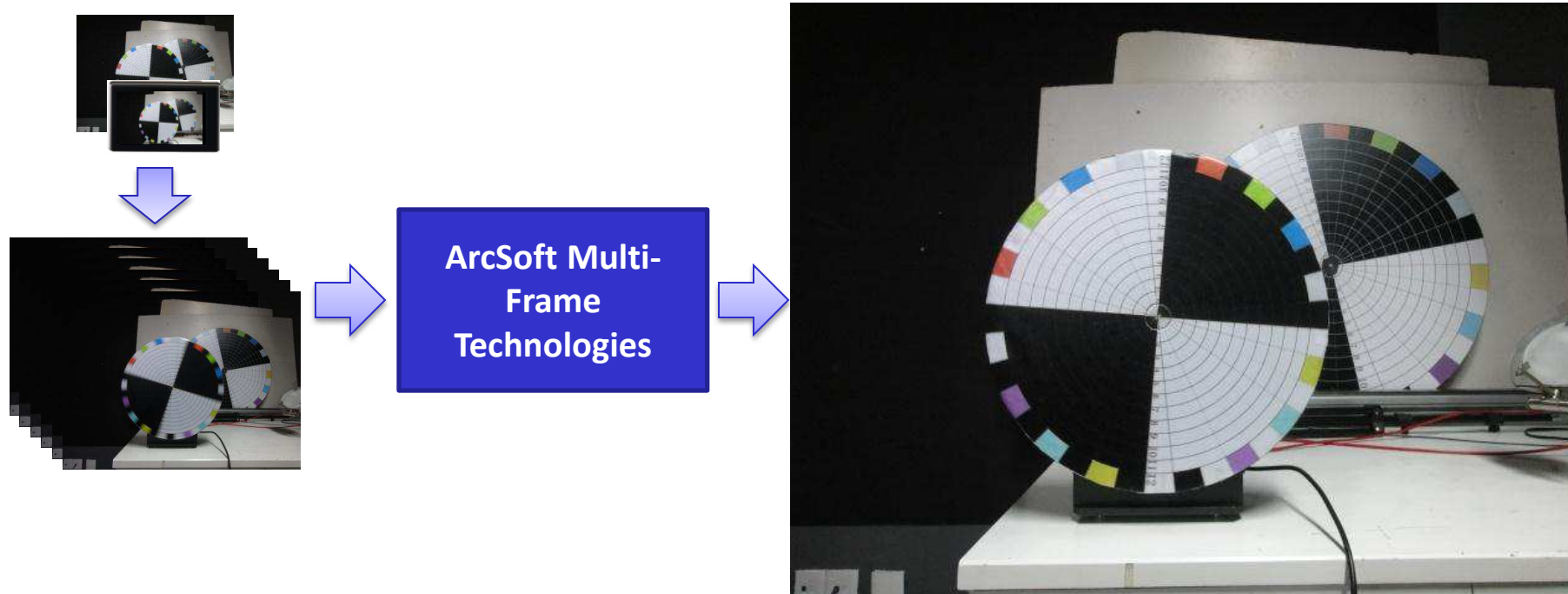
ArcSoft Multi-Frame Technology Portfolio

- **Multi-Frame Night Shot**
- **Panorama BurstCapture**
- **Multi-Frame Anti-Shaking**
- **High Speed HDR**
- **PiClear (auto object removal)**
- **PicBest (optimal portrait composition)**
- **More...**
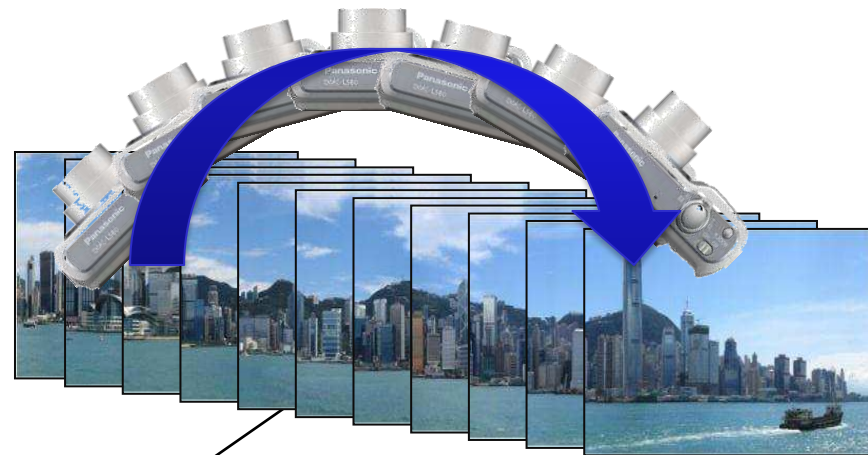
Achieve Better Quality With Multi-Frame

- **Brighter**
- **Clearer**
- **Better resolution**

COMPARING WITH SONY DSC
TX-10

Hardware Requirements

- **Fast burst capture capability (>15 FPS)**

- **Continuous burst to more than 300 shots and stop at any time**

- **For each capture in the burst**
  - H/W noise filter enabled
  - Output in YUV formats
  - Capability to do bracketing
    e.g.   void setEvBracketCapture(float[]); // In NvCamera
  - Capability to change the capture parameters (3A, ISO, Gain, etc)
    e.g.   void void setExposureTime(int); // In NvCamera
  - Capability to lock the capture parameters
    e.g.
       void setAutoExposureLock(boolean lock); // In NvCamera
       void setAutoWhiteBalanceLock(boolean lock); // In NvCamera

Challenges and Expectations

- **Quality of each frame in the burst is sometimes not well-tuned**
  - Especially when captured with non-3A parameters

- **Image frames sometime are not consistent**
  - Even with all capture parameters locked

- **Need downsized image frames passed from ISP**

- **Need Bayer RAW output**

- **Need hardware-based math functions especially for matrix operations**
  - e.g. add, subtract, multiply, absolute difference, division, max, min, linear gradual blend, etc..

Thank You For Your Time