BARISTA: Better Apps through Real-time Image Processing on Smartphones & TAblets

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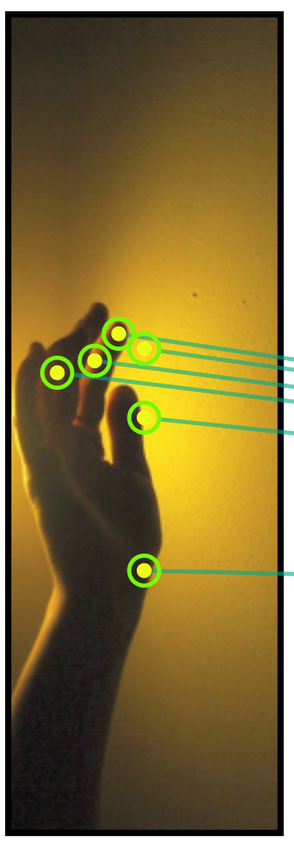
Context

- More and better *front facing* cameras
- More powerful CPUs and GPUs
- *Air Gestures* on Samsung Galaxy S4-5

What?

Image processing has the potential to make user interaction more natural and fluid



As in:

- e-Cookbook: recognize hand gestures to navigate without dirtying screen
- Gaming: recognize facial emotions to adapt difficulty
- Personal trainer: detect body poses to count sit-ups
- e-Reader: follow eye motion to scroll automatically

Improve **user experience** of an existing app

The good news:

There (almost) exists a *technology stack* that makes this possible!

OpenVX

OpenCV

OpenCL

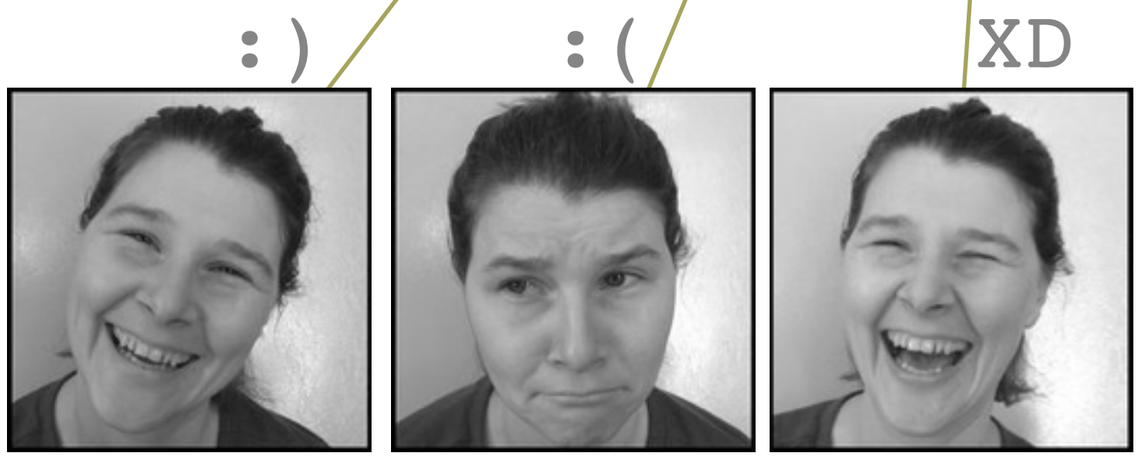
The bad news:

It still comes with a steep learning curve

The BARISTA project

For a number of **case studies**

- Find most appropriate algorithms in scientific literature
- Real-time implementation, using freely available libraries on smartphone/tablet



By researchers with years of expertise in

- Image processing
- Real-time implementations
- CPU, GPU and embedded hardware

Result: building blocks and tutorials to add perfomant image processing to your apps in an easy way

Case studies & platforms: together with interested companies

FAQ

About the project

1. What will the **concrete results** of this project be?
   - For a number of case studies, we will make a detailed **analysis** of the most appropriate image processing algorithms from the scientific literature and of the available implementation technology.
   - We will organize a number of **training events**, which will allow you to get acquainted with the scientific state-of-the-art and the available software libraries.
   - Finally, the project will also deliver a number of **tutorials** and **software building blocks**, which will allow you to easily get started with the technology yourself, if it proves to be suitable for your needs.

2. What kind of project is it?
   - This is an **IWT TETRA (TEchnology TRAnsfer) project**. This kind of project allows a university or college to perform applied research with the goal of increasing the adoption of scientific results (algorithms, methodologies, new insights, ...) by Flemish companies, especially SMEs.

3. What is the current **stage** of this project?
   - We are currently preparing the proposal. Because the link to industry is very important for a TETRA-project, we like to contact companies as early as possible. This will allow us to **adjust** our proposal, based on any feedback that you might provide. If it is approved, the project itself will start in September 2014.

About IWT TETRA projects

4. **Why participate** in a TETRA-project?
   - Such projects allow you to get to know new technology from different vendors in a **risk free** way. You also get support from the project team when developing your own cases. Technology or software libraries that are developed in the project may be used free of charge.
   - You will be able to participate in **training events** and **workshops** that are organized as part of the project. Together with the regular project meetings (at least 3 each year) such events also provide an interesting **networking** opportunity with companies from your own or related areas.
   - You will be able to **steer** the project in the direction of what is truly useful for your company.
   - Your company's **visibility** will increase through our website and publications of the project. Also our students (KU Leuven | Thomas More) will get to know your company, and they will be encouraged to write their master's thesis on topics that are related to the project and/or the participating companies.

5. How **expensive** is participation in a TETRA-project?
   - These projects are sponsored by a **92,5% government subsidy**. The remaining 7,5% has to be provided by the participating companies. Depending on the size of the company and their input in the project, this typically comes down to an amount between 1.000 and 3.000 EUR.

6. What about **intellectual property**?
   - Algorithms and implementations that are developed in the project are intellectual property of the university. At the end of the project, they will be released under a free, non-viral **open source** license, so that companies may use them without obstacle.
   - The companies in the user groups are free to decide how much of their own knowledge they wish to enter into the project (and may choose to protect this through an NDA). The goal of aTETRA-project is technology transfer **towards the companies.**

About the research groups

7. **Who** will carry out this project?
   - The research group **EAVISE** (KU Leuven) is a multidisciplinary research group, made up of researchers from the Dept. of Computer Science and the Dept. of Electrical Engineering (ESAT) of KU Leuven. They provide education to students of Engineering Technology at Campus De Nayer, specifically in the Master of Engineering Technology: Electronics-ICT.
   - The research group **EmSys** (Thomas More Mechelen) is also located at Campus De Nayer and performs research into all aspects of embedded systems. This group provides eduction to students of the Professional Bachelor in Electronics-ICT.

8. What is the **relevant expertise** of these groups?
   - The core activity of EAVISE is developing **industrial applications** of state-of-the-art **image processing algorithms** and methods from **Artificial Intelligence**. Therefore, they are perfectly placed to select the best algorithms for the proposed case studies and to implement them in an efficient way.
   - The EmSys group studies **embedded** platforms and **multicore** hardware, such as the Cell processor or GPU processors. This expertise will prove useful when developing real-time implementations on smartphones and tablets.
   - Both research groups have substantial experience in collaborating with different kinds of companies on a variety of projects. For an overview, see: **www.eavise.be** en **emsys.denayer.wenk.be**.