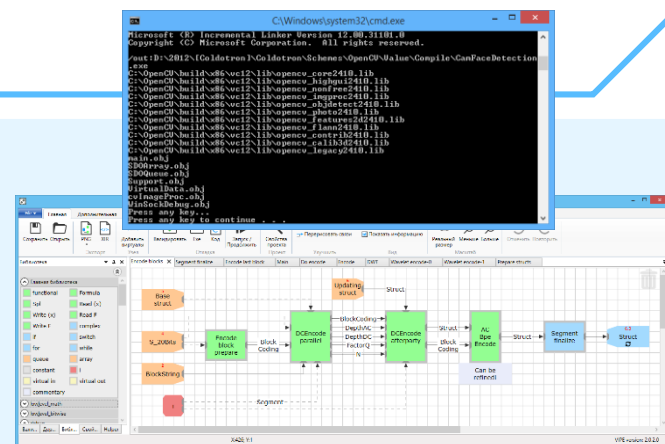## Additional tools

Performance estimation

Analysis of computing characteristics for developed visual programs. Tools provide rapid and effective methods for program characteristics estimation and evaluation through all stages of the program development process.

Analysis methods allow to correct the development process according to given constraints and requirements. It also allows optimizing algorithm structures.
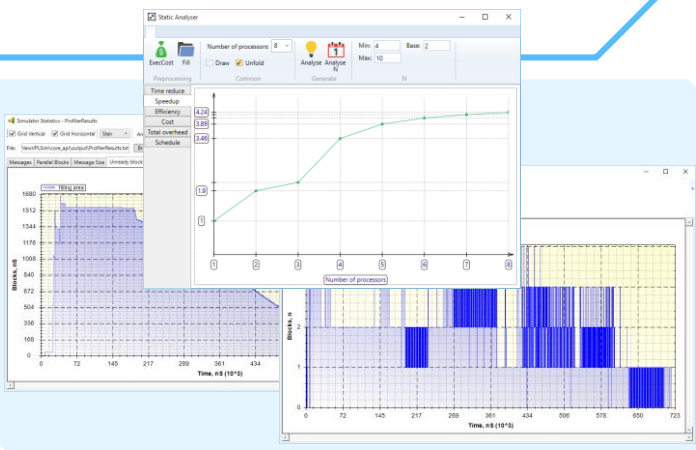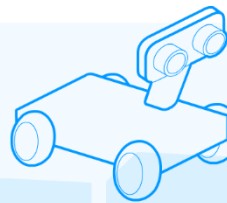
Code generation

Preparation and Integration of developed programs with target embedded heterogeneous manycore platforms.

Code generation tools perform an allocation on different types of cores, provide integration methods, communication and synchronization and generate final code for correct execution in multitasking heterogeneous environment.

Developer

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- Accomplished within the Federal Special Programme of Russian Federation, project "Technology and development tools of the portable embedded software for heterogeneous manycore embedded systems"
- Accomplished within the European technology platform ARTEMIS, project "PaPP"

See how to develop in VIPE on Youtube

Microcontrollers

Video analytics

112 km/h
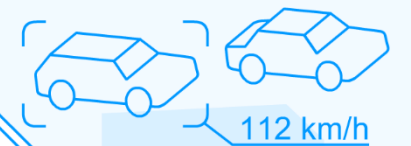
Image recognition

1234 ABC
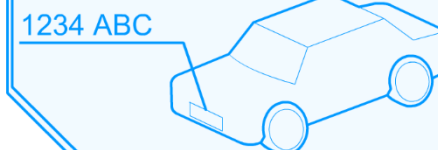
Add specific domain

VIPE

Visual integrated environment for application programming

The VIPE environment provides full development cycle for domain specific programs from an algorithm to a final code, that is ready to upload into a target hardware platform. The high-level visual representation and domain specific libraries significantly accelerate the program development process.

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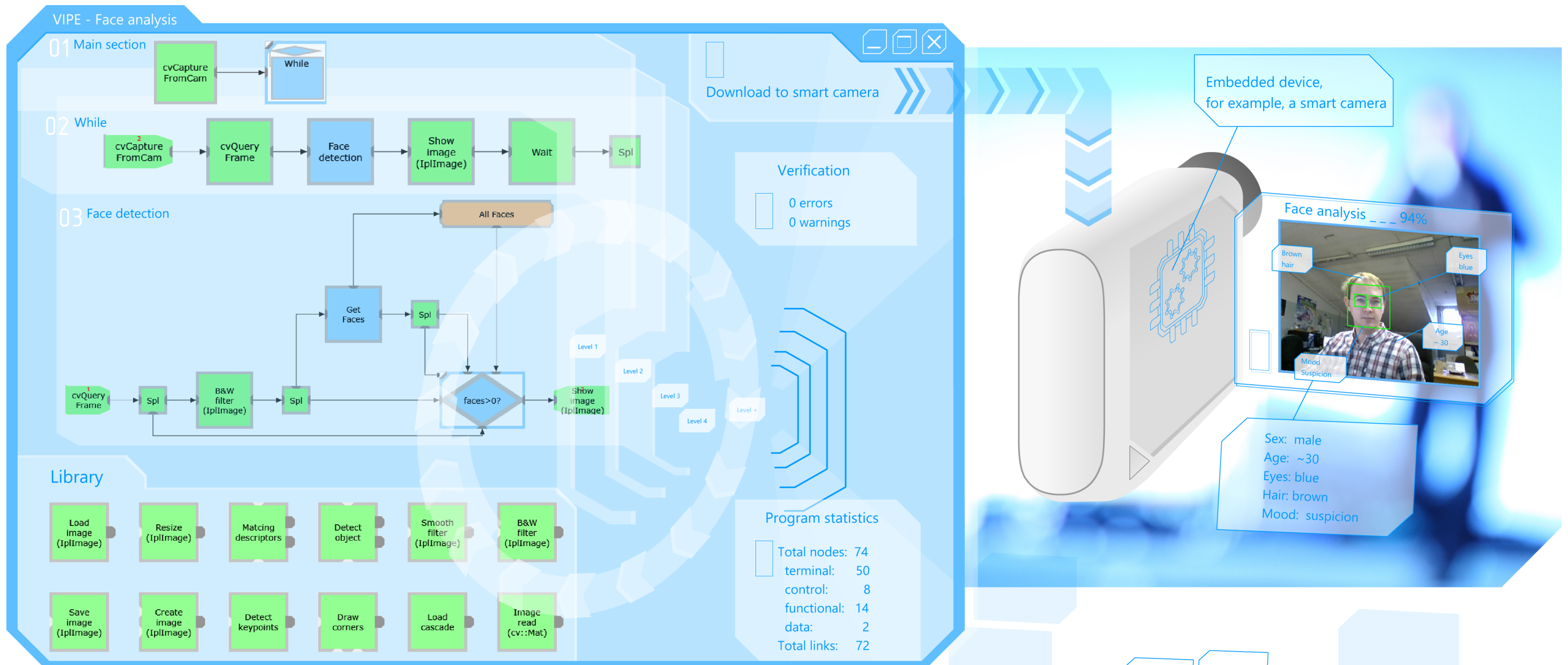# Fast visual high-level development of end-user solutions in VIPE

Create

User works with a high-level visual parallel programming language. For a convenience, program schemes could be multi-layer, the program block could represent a sub-scheme.

Domain-specific libraries usage significantly accelerates a development process: it's enough to connect specific blocks together.

Debug and run

Environment automatically verifies the program during development process. If errors are detected, the program execution possibility is blocked and the error place is highlighted on the scheme.

Integrated tools provide easy debugging on the local PC, compiling and uploading of the program to various target hardware platforms.

VIPE - Face analysis

01 Main section

cvCapture FromCam

While

02 While

cvCapture FromCam | cvQuery Frame | Face detection | Show image (IplImage) | Wait | Spl

03 Face detection

All Faces

Get Faces | Spl

cvQuery Frame | Spl | B&W filter (IplImage) | Spl | faces>0? | Show image (IplImage)

Level 1
Level 2
Level 3
Level 4
Level +

Download to smart camera

Verification

0 errors
0 warnings

Library

| Load image (IplImage) | Resize (IplImage) | Matcing descriptors | Detect object | Smooth filter (IplImage) | B&W filter (IplImage) |

| Save image (IplImage) | Create image (IplImage) | Detect keypoints | Draw corners | Load cascade | Image read (cv::Mat) |

Program statistics

Total nodes: 74
terminal: 50
control: 8
functional: 14
data: 2
Total links: 72

Embedded device,
for example, a smart camera

Face analysis ___ 94%

Brown hair
Eyes blue
Age ~30
Mood Suspicion

Sex: male
Age: ~30
Eyes: blue
Hair: brown
Mood: suspicion

Technology basis

VIPE uses the VPL language based on the formal parallel computation model AGP (Asynchronous Growing Process). AGP model is a result of fundamental researches in parallel computing, evolved during 20 years. It can carry the solution of complex problems that are concerned with parallel computations and heterogeneity of the target platform, allows user to focus exactly on solving application tasks.

See the development process in VIPE on Youtube