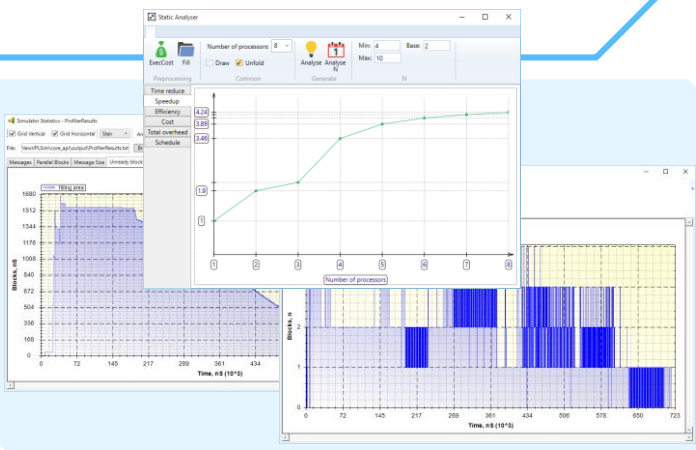


## Additional tools

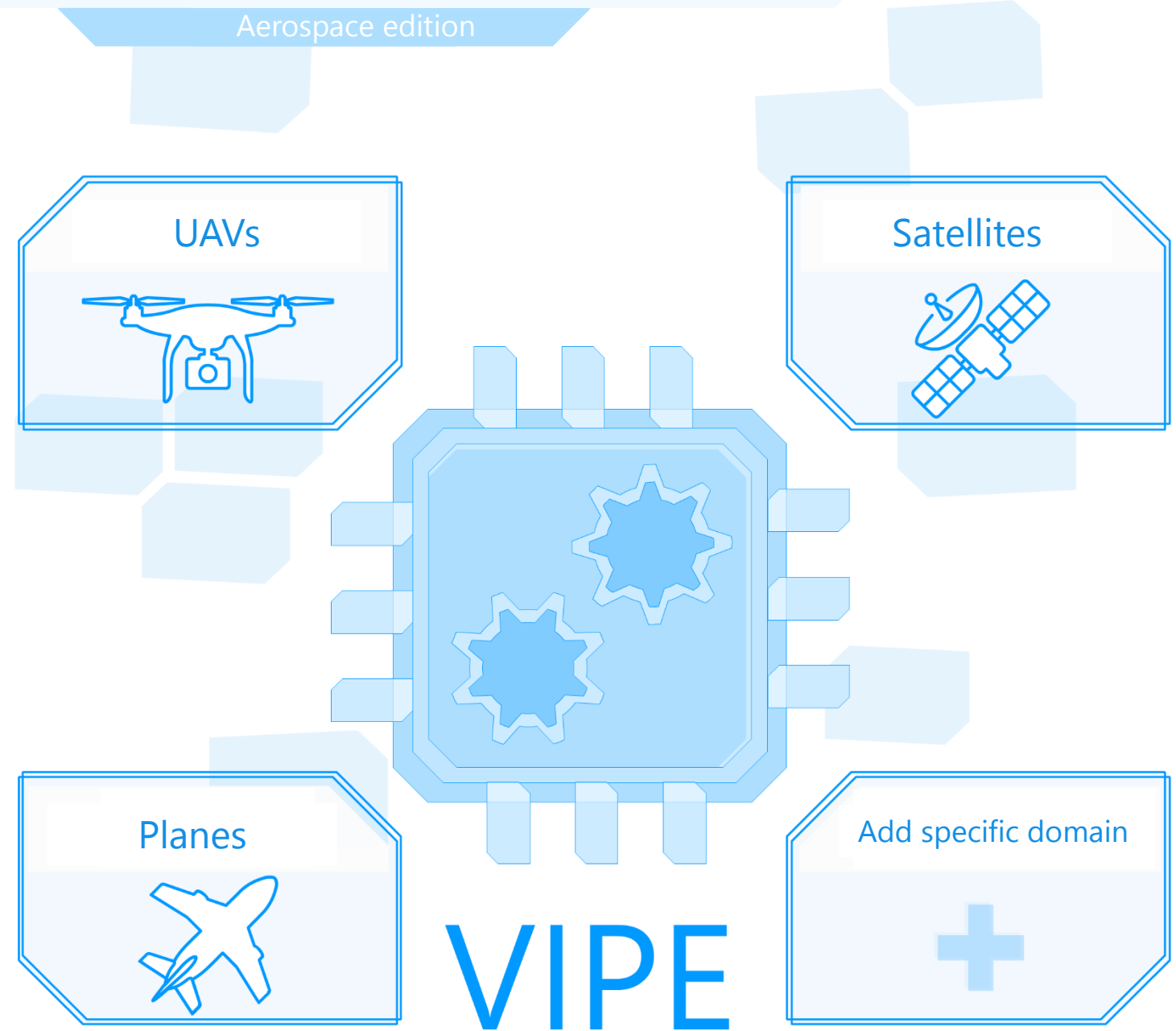
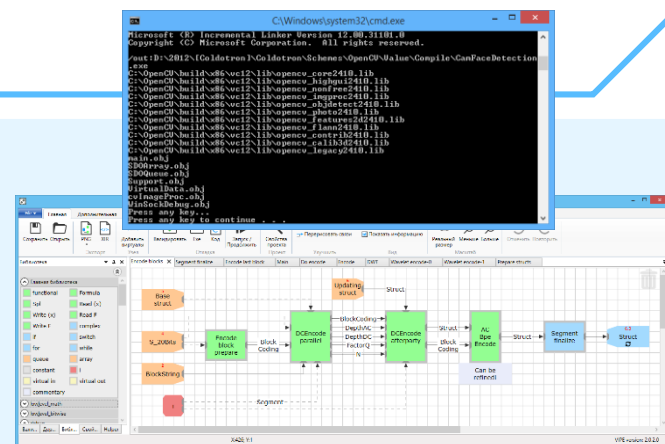
### Performance estimation

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.



## Visual integrated environment for application programming

VIPE – perspective portable software integrated development environment for onboard-embedded systems. The technology allows to involve a domain expert into the design process and provides mechanisms of formal verification and portability of solutions to various target heterogeneous multicore/manycore hardware platforms. The high-level visual representation and domain specific libraries significantly accelerate the parallel program development process.

### 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"

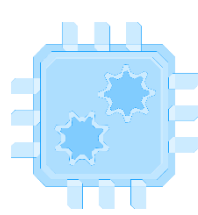
See how to  
develop in  
VIPE on  
Youtube



[vkist@guap.ru](mailto:vkist@guap.ru)



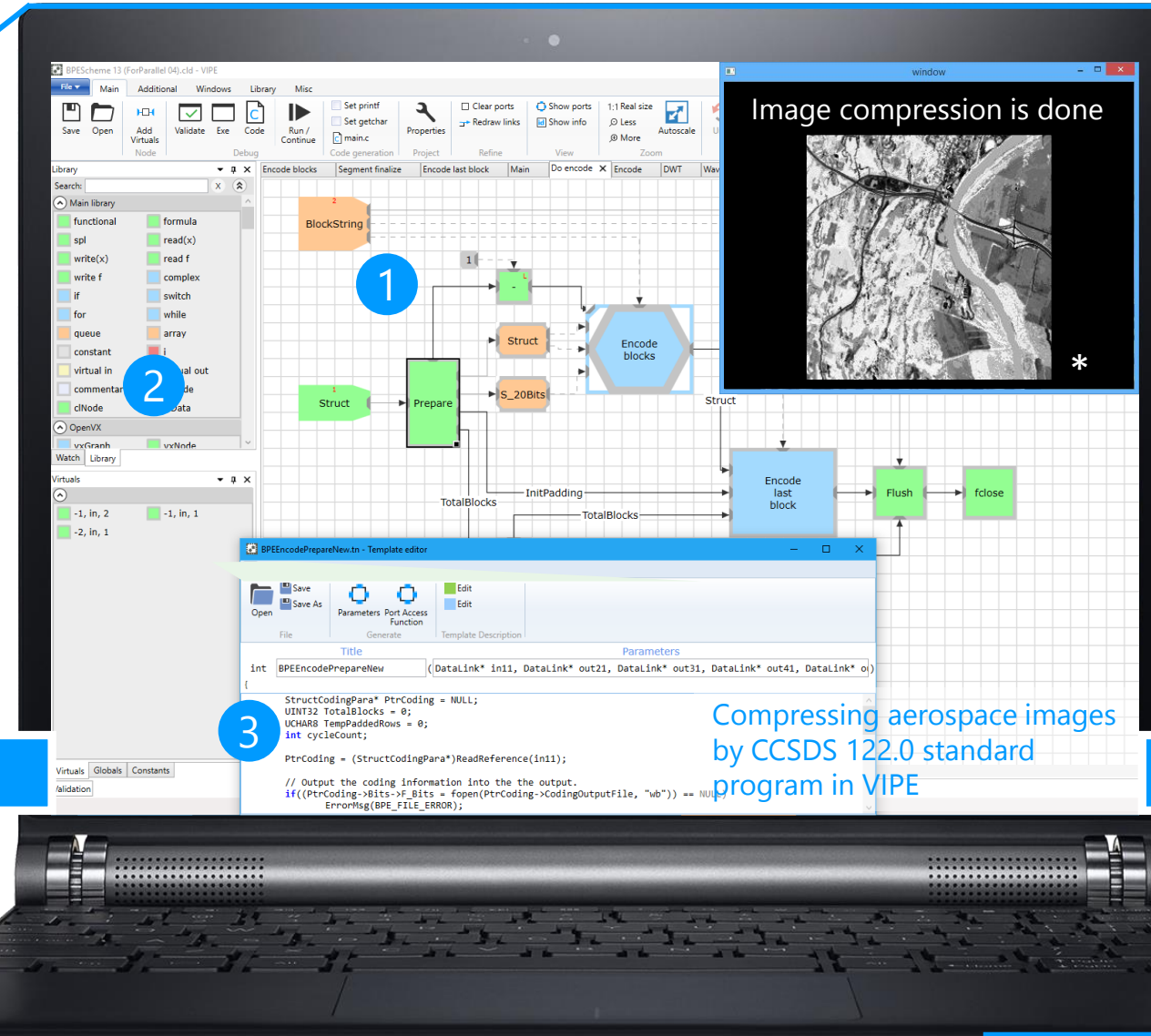
[www.suai.ru](http://www.suai.ru)



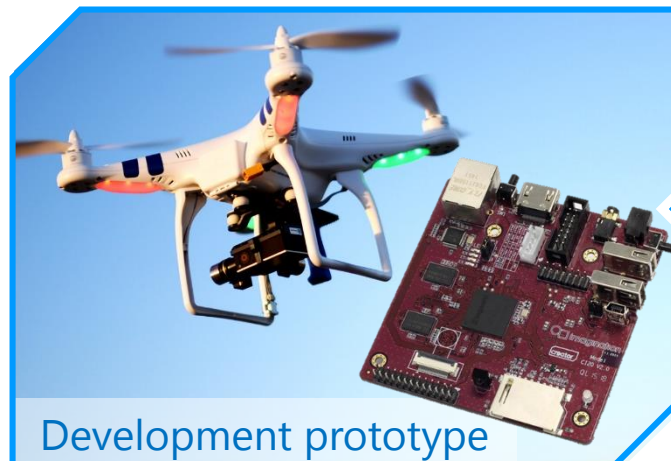
# VIPE – visual environment for portable software development for embedded heterogeneous manycore platforms

## Separate development and programming

**Developer** (domain expert) designs the parallel program scheme<sup>①</sup> using domain specific library elements.<sup>②</sup> The visual program language and libraries are extendable and equipped with tools for adding new functions. If there is no required element in library, a developer describes it by giving the function description and its inputs and outputs.



**Programmer** works with each scheme block separately.<sup>③</sup> He implements only data processing functionality and cannot influence on the parallel program scheme behavior. Thereby program code errors can be easily localized and its probability is decreased without reducing the whole program readability. Program is flexible and easy to change at any stage of a development.



**Environment** allows domain specialist to design various parallel program prototypes rapidly without (or with a minimal involvement of) a programmer/coder.

With additional tools (see the back cover) the development environment allows to:

- make early demonstration of solution prototypes to potential customers
- reduce the time to market for a complex heterogeneous hardware/software solutions
- apply the developed solution to various target multicore/manycore hardware platforms

- Integrity, clarity, effective program maintenance during the software lifecycle
- Decreasing of errors possibility, no direct coder influence on a program scheme behavior, local appearance of code errors
- Flexible program structure, ease of modification on any stage of development
- Instrumentation support for early analysis and characteristics estimation of programs

## 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.

\* Source: <http://hyperspectral.unl.edu>

Check out VIPE features on Youtube in 5 minutes:

