computing is carried out;

- To input video information, a camera (Video Camera Unit – VCU) is used designed to solve computer vision problems: detecting and tracking the user's face in the frame, identifying the user, recognizing the emotions of the subject in the frame based on frames from the video stream. According to the general scheme of the system model 1, the camera transmits the video stream to the computer vision module (computer vision pipeline), and only then the information is sent to the internal part of the system for further processing. The peculiarity of the proposed solution, which gives it additional flexibility, is that the computer vision module can be deployed both on the single-board computer itself and on a separate machine (for example, a PC or a specialized device designed to solve problems of this type). Therefore, the camera can be connected both to a single-board computer directly and to an external device that will transmit information through the abovementioned module to the central device where the OSTIS system core is run. The scheme of the hardware architecture considers the option when the camera is connected directly;
- To speed up the performance of operations on vectors and matrices when calculating neural networks on hardware with limited resources, which include single-board computers, it is proposed to use tensor coprocessors (Tensor Processing Unit – TPU) for neural network calculations.

Let us focus on each of the hardware components of the system and consider them in more detail.

A. Single-board computer

A single-board computer (SBC) is a computer set up on a single printed circuit board, on which a microprocessor, RAM, I/O systems and other modules necessary for the operation of a computer are installed [22], [23].

As the basis of the hardware platform, it was proposed to use a single-board computer, since such a form factor, on the one hand, can provide the necessary and sufficient runtime environment for the OSTIS Technology in terms of performance and functionality and, on the other hand, preserve the minimum weight-and-dimensional and cost characteristics of computing tools, including for solving problems connected with the Internet of things and the usage of OSTIS within the framework of the "Edge Computing and AI" [24], [25] concept.

We have reviewed and compared the models of singleboard computers on the local and international markets that are available for delivery to the territory of the Republic of Belarus. The model lines of computers from such manufacturers as Interl NUX, LattePanda, Rock Pi, UDOO, ODYSSEY [26] were considered. We have set the maximum cost of a single-board computer, so that it

does not significantly exceed the cost of the option for the ARM architecture. The set cost was no more

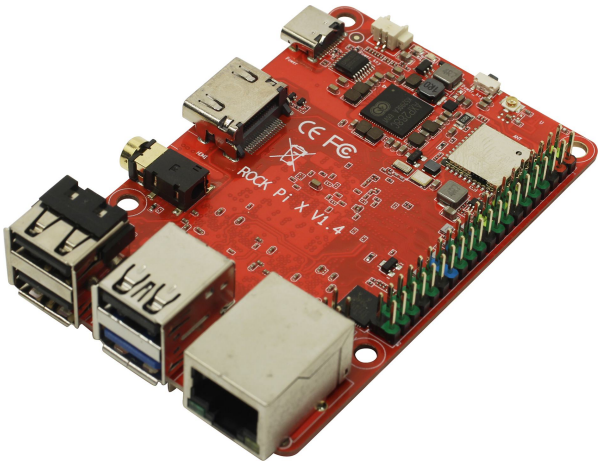

Figure 13: A single-board computer "Rock PI X Model B"

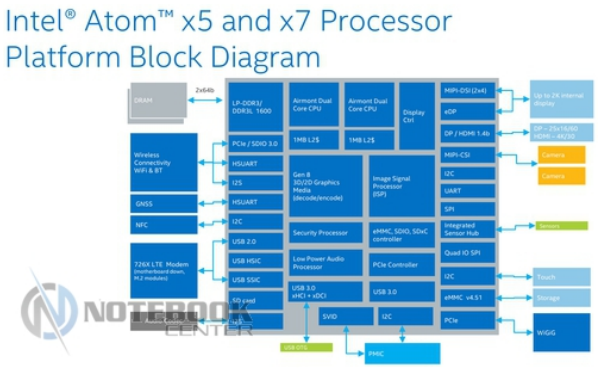

Figure 14: A single-board computer "Rock PI X Model B"

than $100, which significantly narrowed the search area.

Among the currently available models of single-board computers, the Rock Pi computer has become the most preferred option, namely the Rock PI X Model B model [27], the appearance of which is shown in fig. 13.

The functional diagram of the CPU [28], [29] is shown in figure 14.

A distinctive feature of this single-board computer is the presence of ROM based on eMMC, which allows ensuring the functioning of the system and high-speed access to data on a solid-state drive without using an external SD drive. The maximum available capacity is 128 GB. The proposed architecture uses a version with 32 GB of memory, which is sufficient to contain the OS as well as the necessary software modules and OSTIS intelligent agents.

B. Video camera

It is an element of the system, through which a video stream is received and transmitted to a single-board computer to solve subproblems connected with computer vision and recognition of visual images. It acts as