

EURIPIDES FORUM in Helsinki

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SEAMOVES

Sensor Enabling Autonomous Motion
By Optimized Visual Environment Sensing

Abstract

Navigation of small unmanned vehicles equipped with bulky laser scanners or visual sensors, demands computationally intensive algorithms. A key to the development of autonomous systems market (cars, care or assistant robots, security agents ...) is the availability of compact, low cost smart sensors for navigation.

Consortium overview / Complementaries / R&D chain

Around an innovative chip designer (AIT), the consortium is composed of partners involved in sensors and subsystems design for imaging and robotics (Thales R&T, TOSA, LASMEA) and end users in the field of automation of vehicles (LASMEA, ECA, TOSA), or personal robotics and assisted living (Aldebaran)

Keywords

Smart sensor, neuromorphic chip, visual navigation, embedded processing, panoramic vision

Fields of Application

The main fields of application are autonomous systems (cars, automatic vehicles for factory automation...), assisted living (awareness, home robotic platforms ..), security and safety (area surveillance, anti-intrusion ...)

The functionality and performances will be tested on various robotic platforms. The system will also be evaluated for security applications on stationary and non-stationary platforms.

Project objectives

Develop an innovative smart sensor for autonomous visual navigation based on a neuromorphic vision chip, 360° fast panoramic scanning. Embed low-level processing, and intelligent navigation functions

Technical challenges

Optimize the linear detector : resolution, sensitivity, pixel rate
Re-visit the processing for this innovative, event driven imager
Develop a small-size, low consumption scanning system
Optimize the processing architecture

Project Solutions / Results

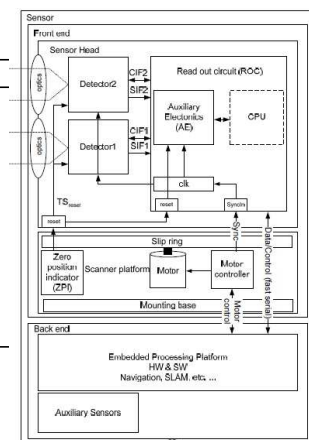
Specifications

- the base sensor requirements have been derived from use cases analysis, and from sensor market situation
- the neuromorphic chip specifications have been defined
- The sensor architecture has been settled

Next steps

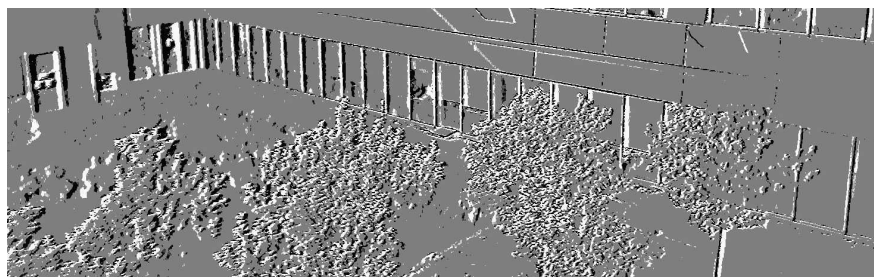
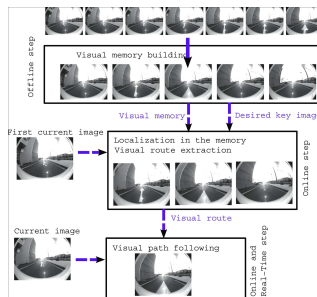
- design of the opto-mechanical scanner
- chip design
- architecture of the processing electronics

Website : <http://www.seamoves-eureka.eu/>



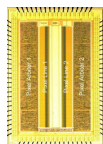
Sensor architecture

Visual navigation



Gradient image

Neuromorphic chip



Panoramic scanner



Test platform

