

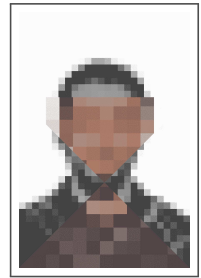
Ernest Skrzypczyk

*Master in
Control Engineering,
Robotics and
Applied Informatics*

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France

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📄 <https://github.com/em-er-es/>



Education

- 2015 – 2017 **Master in Control Engineering, Robotics and Applied Informatics – Advanced Robotics, Double Masters Degree, Erasmus Mundus, European Masters in Advanced Robotics + (EMARO+),** Università degli studi di Genoa / University of Genoa, Italy – 1st year, École Centrale de Nantes / Centrale Nantes, France – 2nd year.
- 2007 – 2011 **Bachelor of Science - Electrical Engineer - Control Engineering and Robotics, Wrocław University of Technology, Wybrzeże Wyspiańskiego 27, PL-50370 Wrocław, very good / bardzo dobry.**
ISCED 5A, Polish grading system; See supplement to diploma, page 5
- 2004 – 2006 **Abitur, Berufsbildende Schulen Meppen - gew. und kaufm. Fachrichtungen - Fachrichtung Technik, Nagelhof 83, D-49716 Meppen, 3,0 - good / gut.**
ISCED 3A, German grading system

Master thesis

- Title *UGV and UAV collaboration within an autonomous infrastructure*
- Supervisor Docent / Maître de conférences Olivier Kermorgant
- Description Development of a collaborative, decentralized and heterogeneous SLAM based on previous work within ROS and V-REP framework at LS2N, formerly known as IRCCYN.

Engineering project

- Title *Metrological properties of a hybrid amplifier*
- Supervisor PhD / dr inż. Daniel Dusza
- Description Design, construction and measurements of a hybrid amplifier with a working frequency within the audible range and a microcontroller based control system.
- Grade excellent / celujący
- Prizes and Awards Stowarzyszenie Elektryków Polskich - Association of Polish Electrical Engineers
1st place for best thesis in Electrical Engineering Department on Wrocław University of Technology in the academic year 2010/2011

Vocational experience

- 01.04.2019 – **Freelancing research engineer & developer, Varied, global.**
- Current Supportive research engineering in navigation of autonomous vehicle. Custom solutions for various projects such as custom mpv GUI design and extended functionality for monitoring. Technical support for GNU/Linux systems. Development of image restoration pipelines for old video material.

- 01.07.2018 – **GNU/Linux embedded system engineer**, *Undisclosed*, A-1040 Vienna, Austria.
- 01.03.2019 Design and implementation of a custom GNU/Linux system solution on industrial grade version of Raspberry Pi and Nvidia Jetson TX2 for a naval monitoring and anti-collision system.
- 01.11.2017 – **Research engineer**, *IRT Jules Verne*, F-44340 Nantes/Bouguenais, France.
- 30.06.2018 Vision and laser sensor data fusion, source code, mostly in C++, update, optimization and maintenance (CI), packaging, design and development of GUI for state representation as well as basic control of autonomous cobot unit *Asimov* working in workshop at Airbus.
- 01.02.2017 – **Master thesis work**, *École Centrale de Nantes, LS2N (formely known as IRCCYN) – ARMEN*, F-44300 Nantes, France.
- 31.08.2017 Work on the master thesis as part of the ARMEN team.
- 2011 – 2015 **Self development**, *Improvement of skills in various areas, mostly hardware and GNU/Linux related. Active member of the Arch Linux community.*
- 12.07.2010 – **Electrician helper**, *Elektro Westendorf GmbH*, D-49777 Klein Berßen, Germany.
- 20.08.2010 Electrical installations on construction sites. Also photovoltaic, other renewable energy and light systems. Internship for studies at the Wrocław University of Technology.
- 14.07.2008 – **Electrician helper**, *Elektro Westendorf GmbH*, D-49777 Klein Berßen, Germany.
- 15.08.2008 Electrical installations on construction sites. Also photovoltaic, other renewable energy and light systems.
- 2 weeks in **Computer scientist**, *Ebert Mikrokomputer GmbH*, D-49716 Meppen, Germany.
- May 2005 Computer system installations mostly in the private sector. Customer care on site. Secondary school internship.

IRT Jules Verne

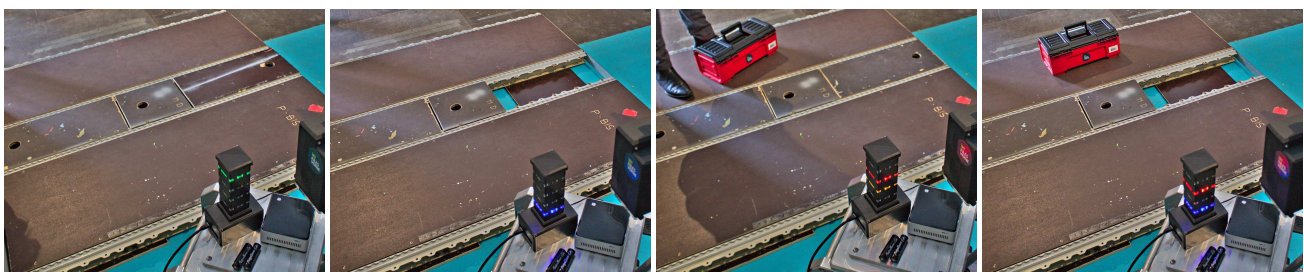
Sensor Pack Objectives:

- Software update, optimization and maintenance
 - Ubuntu 16.04 LTS / ROS Kane Kinetic
 - REPs combined with in house conventions
 - Deployment of ROS packages
- Fusion of sensor data from several sources
- Positive, negative and human obstacle detection
- Obstacle output as sensor_msgs/LaserScan
- Integration of the sensor pack (SPACK)
- Design and implementation of GUI for state representation and simple control
- Documentation of source code and ROS specifics
- Continuous Integration (CI)

Acquired experience:

- Custom GIT workflow based on OneFlow
- Continuous Integration
 - Implementation of custom Continuous Integration on a local GitLab server
 - Implementation of Continuous Integration into the development process
- Dynamic Doxygen generated documentation
- Estimation of code performance via benchmarks
- Use of Raspberry Pi for visualization of obstacle detection

Airbus Innovation Day showcase



Clear

Hole

Obstacle and human

Obstacle and hole

Computer skills

Operating systems	Extensive experience with GNU/Linux, Microsoft Windows Some experience with hardware specific solutions and FreeBSD		
Distributions	Ubuntu, Arch Linux, OpenSUSE, Funtoo, Gentoo, Linux Mint, Rasbian and others		
Software experience	Various CAD/CAE, office, scientific applications and suites across most media fields including audio, video, graphics, documentation, text, design, simulation and engineering		
Applications / Suites	LibreOffice, Microsoft Office, Altium Designer, Simatic Step 7, CX-Programmer, Adams, Delmia, Matlab, LabVIEW, Scilab, Multisim, Spyder IDE, Python(x,y), V-REP, Proto, Photoshop, Darktable, Gimp, Inkscape, Ableton Live, Audacity, FFmpeg, Graphviz, Doxygen, Geany, Sublime Text, Atom, TeXstudio, nano		
Shells / Command line interfaces	Zsh (current main shell), Bash, Command Prompt	Software and community contributions	Proto, Arch Linux Wiki articles (ALSA), Arch Linux Forums and packages maintenance, wine, q4wine

Repositories

GitHub	github.com/em-er-es/	Scripts	scripts	EMARO+	reports
DevOps	devops	Robotics	rollo, rollo-slam, coslam-vrep	Computer Vision	imb, clahe, mask pattern

DevOps, SysAdmin

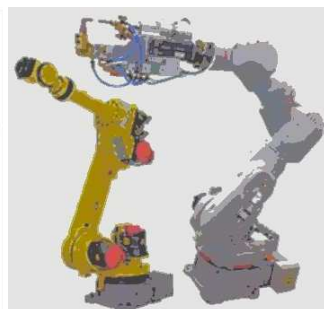
Technologies, frameworks	<ul style="list-style-type: none"> Continuous Intergration/Continuous Deployment (GitLab CI/CD) <ul style="list-style-type: none"> IMB full development cycle CI/CD with Docker, TDD, profiling and coverage CI for developed ROS packages Packaging (Arch, Ubuntu, OpenSUSE, OBS) Virtualization (Docker, QEMU) <ul style="list-style-type: none"> Building applications in Docker for use in host Running Xorg applications in Docker VM with iGPU and USB passthrough Version control system (Git) Software Control Management (GitLab, GitHub, BitBucket) Documentation (Doxygen, Pandoc) Systemd services and scripts Extensive automation through scripting Networking (PXE boot on direct LAN)
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Computer Vision

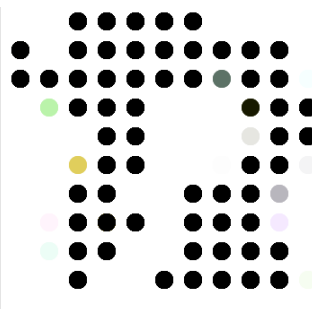
Software	<ul style="list-style-type: none"> Image processing Modular Blocks (IMB) Mask pattern filter (Python) Image/Video restoration pipelines CLAHE (Contrast Limited Adaptive Histogram Equalization)
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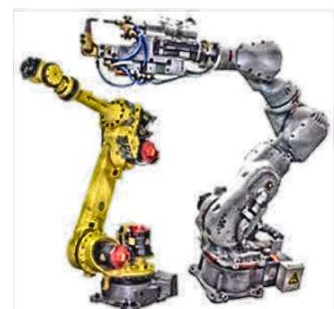
Input



IMB



Mask



CLAHE

ECN Projects and assignments:

- Homography based visual odometry
- Visual servoing and analysis using 2D, 3D and 2.5D/hybrid feature modelling
- Modelling and simulation of a 6 DOF articulated industrial robot in Delmia performing a spot welding task
- Optimal placement and kinematic design of a SCARA robot
- Kinematic design and analysis of a 3-RRR planar parallel robot
- Lateral and longitudinal control in a leader-follower and predefined path scenarios for a platoon of 5 vehicles
- Modelling, kinematic and dynamic analysis of a biglide mechanism, computed torque control (CTC) design and co-simulation in Adams and Matlab, crossing of type 2 singularity
- Modelling, kinematic and dynamic analysis of a 5-bar mechanism, CTC design and co-simulation in Adams and Matlab
- Modelling, analysis, experimentation and simulation of human motion using a motion capture system and pressure plate for different actor movements
- Dynamic modelling, passive walking, optimization and stability analysis of a compass robot
- Angular position and velocity estimation of a DC motor using Kalman filter

UNIGE Projects and assignments:

- Localization of a biped humanoid robot using *EKF* within ROS framework (**Repository**)
- Study and implementation of developed *SLAM* algorithms for a biped humanoid robot within ROS framework (**Repository**)
- Mobile robots control: point and posture tracking, Lyapunov control, design and simulation
- Mobile robots motion planning using bug, distance based and probabilistic roadmap planning algorithms
- Offline and online tuning of EKF in a real world case scenario using landmarks
- Technical report on Agriculture in controlled environments
- Technical paper review and presentation on FLEXA
- Delmia simulations using custom designed grippers and objects
- Design and evaluation of a user interface for a motion analysing application
- Basic image processing including edge and object detection, colour based segmentation, optical flow (Lucas-Kanade algorithm) and stereo vision
- POSIX compliant publisher / subscriber communication models using pipes and pthreads
- Realtime scheduling with RM, PS and EDF

Languages

Polish	Native	
English	B2+	TOEFL iBT - 108 / 120 points, date of exam: 05.10.2010 Mark: very good / bardzo dobry at SJO WUT
German	Native/C1	100% exam test score, 2nd place in contest at FLD WrUT
Spanish	A2	Mark: good, high school secondary language for 2 years
Italian	B1	Score 25/30, spent 1 year in Genova, Italy within EMARO+ programme
French	A1	Score 68/100, spent 1 year in Nantes, France within EMARO+ programme

Programming languages

General languages	<ul style="list-style-type: none">◦ <i>Assembler on various hardware</i>◦ <i>BASIC on Commodore 64 and various BASIC derivatives on robots</i>◦ <i>C/C++ in professional environment, courses, assignments, projects and contributions</i>◦ <i>LUA</i>◦ <i>Python</i>	
Frameworks, libraries	<ul style="list-style-type: none">◦ <i>OpenCV</i>◦ <i>ROS - Robot Operating System</i>	<ul style="list-style-type: none">◦ <i>PCL</i>◦ <i>V-REP</i>
PLC languages	<ul style="list-style-type: none">◦ <i>Function block diagram</i>	<ul style="list-style-type: none">◦ <i>Ladder logic</i>
Scripting	<ul style="list-style-type: none">◦ <i>Bash / Zsh</i>◦ <i>Matlab / Scilab / Pythonxy / Spyder</i>	<ul style="list-style-type: none">◦ <i>Command Prompt / Batch</i>◦ <i>AutoHotkey</i>

Hardware

IT	Raspberry Pi (1, 2, 3 industrial), NVidia Jetson (TX1, TX2), Android smartphone
Designs	Hybrid amplifier, power supply, various audio equipment
Electrical	Electrical motors, industry grade electrical motors, [car] audio equipment
Electronical	Embedded systems, microcontrollers and DSP (8051, AVR ATtiny & ATmega, TMS320c6xxx), servomotor, LCD
Programming interfaces	<i>SPI, JTAG</i>
Robotics	<i>Biped humanoid robot</i> , industrial articulated robot
Sensors	RBG/RBG-D cameras, LiDAR, motion capture, sonar, capacitive
PLC	Siemens, Mitsubishi, OMRON
Skills	Soldering THD and SMD, basic material processing, engraving, welding

Volunteering

Technical support in the broad domain of system administration, multimedia, various technologies and frameworks

Technical proofreader and writer

Image and video editing, restoration, postprocessing

Work at animal shelter

Certificates, Licences

Electrical qualification	Operation position in the area of: operation, maintenance, repairs and assembly	<i>SEP - AoPEE, Wrocław</i> <i>Date of exam: 19.05.2010</i> <i>Valid for 5 years</i>
Driving licence	Class A, B	<i>Driving licence acquired in Germany in 2005</i>

Organisations, associations and memberships

ECN	Student representative for EMARO+ ECN	
SNS	Academic student association	<i>Took part in several projects, educational trip and made a publication for the SSC 2009</i>
STRIMER	Wrocław University of Technology	

Additional courses

2018

Genova, UNIGE Regularization Methods for Machine Learning

2017

Nantes, ECN Autonomous vehicles

Nantes, ECN Humanoid and walking robots

2015

Warsaw ABC of enterneurship

Warsaw Self presentation and interview skills

Publications

Rzepecki Bartłomiej, Skrzypczyk Ernest, *"Plasma and its applications"*,
7th Students' Science Conference, Wrocław, Poland, 2009

Prizes and Awards

Prize 1st place for best thesis in Electrical Engineering Department on Wrocław University of Technology in the academic year 2010/2011

Prize Second place in German language tournament at FLD WrUT

Commendation For best paper presentation at SSC 2009

Aknowledgment Third place for best group work at SSC 2009

Scholarships

Several scholarships for achievements in studies at the WrUT Faculty of EE

Interests

- Arts
 - Graphics, photography, image rendering and manipulation
 - Music, audio creation and manipulation
 - Paper model building
- Philosophy
 - New socio-economic structures
 - Consequences of implementation of new technologies
- Technology
 - Self-sustainable autonomous vehicles, facilities and infrastructure
 - Robot interaction
 - Artificial intelligence
 - FOSS, especially GNU/Linux
 - Open Hardware, Open Technology, Open Economy

Additional information

Mobility Full mobility within 157 countries, especially across Europe

Self-development Main focus on shifting working environment towards FOSS, contribute and exchange with the FOSS community.