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Lazarus and Fortran for Africhino Quasi-Computer

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Micro-computer and micro-controller Open Source devices are often used to perform experiments in the science field. According to recent publications, the most used platforms are the Arduino Micro-controller board and the RaspberryPi micro-computer[1].

Africhino represents an alternative to the aforementioned devices, designed around the exigency of the researchers [2]. Africhino Quasi-Computer (AQC) is a portable laboratory tool, which contains the most necessary instruments to design and testing electronic devices and experimental data measurements. The peripherals of AQC are controlled through a Linux based RaspberryPi or other Open-Hardware micro-computer.

Usually to produce data plotting programs and serial communication between the micro-computer and external devices python is used. Python has an extended mathematical library for data elaboration. Python is an interpreted program language and any no intrinsic mathematical model require more time to be executed [3]. In this work we shown that Lazarus and Fortran can be used as alternative to Python on Open Source Devices. Both Lazarus and the well know Fortran are compiled program languages. Lazarus and Fortran complement each other. Using Lazarus, data plotting and Graphical User Interfaces are easy implementable. Fortran has an extensive mathematical library.

In this research Lazarus and Fortran are linked by using the Shared Object (so) to obtain an optimised code to acquire value from the external peripherals and data elaboration. The performance of Lazarus-Fortran versus Python is tested on thermal transmission system. For each temperature field acquired, an algorithm predicts the internal temperatures of the body. For this study the algorithm for Lazarus-Fortran is the same used for Python, and no intrinsic functions are used.

[1] D Cressey, Age of Arduino, Nature, Vol. 522, pp. 125-125, 6 April 2017

[2] M Mariola and F Petruccione, Open-Source electronic board designed in South Africa for Africa, in The Proceedings of the 60th Annual Conference of the South African Institute of Physics (SAIP2015), edited by Makaiko Chithambo (RU) and André Venter (NMMU) (2015), pp. 457 - 62. ISBN: 978-0-620-70714-5 Available online at <http://events.saip.org.za>

[3] Comparing Python, NumPy, Matlab, Fortran, etc., URL: <https://modelingguru.nasa.gov/docs/DOC-1762>

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No

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N/A

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Yes

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