



Contribution ID: 213

Type: **Poster Presentation**

## Building a ternary computer

*Tuesday, 4 July 2017 17:10 (1h 50m)*

Calculations and automatic processes are generally performed by analogue, digital or hybrid computing depending on the problem to be solved. Nowadays the majority of calculations and control systems are executed on digital devices such as computers, microcontrollers and Field-Programmable Gate Arrays (FPGA). In the past other calculation machines such as analogue computer and ternary computer were proposed.

The development of analogue and ternary machines was abandoned in the past and in this research we aim to investigate the performance of the aforementioned systems, using modern electronic components. This research is particularly interested in ternary computers. The ternary machine does not use only two states but uses three level states. The ternary logic is also related with quantum computing and extreme machine learning [1].

Even though the research on ternary logic has been abandoned we intend to use its theoretical advantage of high memory and efficiency over binary codes. With the success in building the aforementioned circuits, experiments will be performed to compare digital, analogue, ternary and hybrid calculations performance. The device will be useful for better communication, computer simulations, military testing, encryption and automatic control systems.

References:

[1] Mark van Heeswijkn , Yoan Miche, "Binary/ternary extreme learning machines", Neuro Computing, Elsevier, December 2015.

**Apply to be considered for a student &nbsp; award (Yes / No)?**

Yes

**Level for award&nbsp;(Hons, MSc, &nbsp; PhD, N/A)?**

Hons

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Yes

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**Session Classification:** Poster Session 1

**Track Classification:** Track F - Applied Physics