

**Record 1 of 1****Title:** An Analysis of a Hard Real-Time Execution Environment Extension for FreeRTOS**Author(s):** Stangaciu, C; Micea, M; Cretu, V**Source:** ADVANCES IN ELECTRICAL AND COMPUTER ENGINEERING **Volume:** 15 **Issue:** 3 **Pages:** 79-86 **DOI:** 10.4316/AECE.2015.03011 **Published:** 2015**Times Cited in Web of Science Core Collection:** 0**Total Times Cited:** 0**Usage Count (Last 180 days):** 0**Usage Count (Since 2013):** 0**Cited Reference Count:** 20

**Abstract:** FreeRTOS is a popular real-time operating system, which has been under a significant attention in the last years due to its main advantages: it is open source, portable, well documented and implemented on more than 30 architectures. FreeRTOS execution environment is dynamic, preemptive and priority based, but it is not suitable for hard real-time tasks, because it provides task execution determinism only to a certain degree and cannot guarantee the absence of task execution jitter. As a solution to this problem, we propose a hard real time execution extension to FreeRTOS in order to support a particular model of HRT tasks, called ModXs, which are executed with no jitter. This article presents a detailed analysis, in terms of scheduling, task execution and memory usage of this hard real time execution environment extension. The article is concluding with the advantages this extension brings to the system compared to the small memory and timing overhead introduced.

**Accession Number:** WOS:000360171500011**Language:** English**Document Type:** Article**Author Keywords:** jitter; operating systems; performance analysis; real time systems; scheduling algorithm**KeyWords Plus:** HARETICK KERNEL**Addresses:** [Stangaciu, Cristina; Micea, Mihai; Cretu, Vladimir] Politehn Univ Timisoara, Comp & Software Engrn Dept, Timisoara 300223, Romania.**Reprint Address:** Stangaciu, C (reprint author), Politehn Univ Timisoara, Comp & Software Engrn Dept, 2 Vasile Parvan Blvd, Timisoara 300223, Romania.**E-mail Addresses:** certejan@dsplabs.cs.upt.ro; mihai.micea@cs.upt.ro; vladimir.cretu@cs.upt.ro**Publisher:** UNIV SUCEAVA, FAC ELECTRICAL ENG**Publisher Address:** UNIV SUCEAVA, FAC ELECTRICAL ENG, STEFAN CEL MARE, UNIVERSITATII 13, SUCEAVA, 720229, ROMANIA**Web of Science Categories:** Computer Science, Artificial Intelligence; Engineering, Electrical & Electronic**Research Areas:** Computer Science; Engineering**IDS Number:** CP8VA**ISSN:** 1582-7445**eISSN:** 1844-7600**29-char Source Abbrev.:** ADV ELECTR COMPUT EN**ISO Source Abbrev.:** Adv. Electr. Comput. Eng.**Source Item Page Count:** 8**Funding:**

Funding Agency	Grant Number
Ministry of National Education, Romania	POSDRU/159/1.5/S/137070
European Social Fund - Investing in People, within the Sectoral Operational Programme Human Resources Development	

This work was partially supported by the strategic grant POSDRU/159/1.5/S/137070 (2014) of the Ministry of National Education, Romania, co-financed by the European Social Fund - Investing in People, within the Sectoral Operational Programme Human Resources Development 2007-2013.