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#34 (1570617520): Dynamic Frequency Scheduling for CubeSat's On Board and Data Handling Subsystem




Critical milestones are due


Due (edit)	Conference	Task	Responsible	Explanation	Notes	Reminded	Completed (mark complete)	Completed by
	March 2020							
Mar 16, 2020	ICSSA2020	Proceeding services set up	chair, publication	Chairs determine what kind of proceeding-related EDAS services they need: none			late	








Property	Change Add	Value																																																		
Conference and track		2020 3rd International Conference on Smart Sensors and Application (ICSSA) - 2020 International Conference on Smart Sensors and Application																																																		
Authors		<table border="1"> <thead> <tr> <th>Drag to change order</th> <th>Name</th> <th>ID</th> <th>Edit</th> <th>Flag</th> <th>Affiliation (edit for paper)</th> <th>Email</th> <th>Country</th> <th>Email</th> <th>Delete</th> </tr> </thead> <tbody> <tr> <td></td> <td>Sharizal Fadlie Sabri</td> <td>1264759</td> <td></td> <td></td> <td>Malaysian Space Agency (MYSA), Malaysia Universiti Teknologi Malaysia, Malaysia Universiti Teknologi Malaysia, Malaysia Universiti Teknologi Malaysia</td> <td>fadlie@mysa.gov.my</td> <td>Malaysia</td> <td></td> <td></td> </tr> <tr> <td></td> <td>Noor Azurati Ahmad</td> <td>236071</td> <td></td> <td></td> <td>Malaysia Universiti Teknologi Malaysia, Malaysia Universiti Teknologi Malaysia, Malaysia Universiti Teknologi Malaysia</td> <td>azurati@utm.my</td> <td>Malaysia</td> <td></td> <td></td> </tr> <tr> <td></td> <td>Shamsul Sahibuddin</td> <td>442663</td> <td></td> <td></td> <td>Malaysia Universiti Teknologi Malaysia, Malaysia Universiti Teknologi Malaysia, Malaysia Universiti Teknologi Malaysia</td> <td>shamsul@utm.my</td> <td>Malaysia</td> <td></td> <td></td> </tr> <tr> <td></td> <td>Rudzidatul Dziyauddin</td> <td>544357</td> <td></td> <td></td> <td>Malaysia Universiti Teknologi Malaysia, Malaysia Universiti Teknologi Malaysia, Malaysia Universiti Teknologi Malaysia</td> <td>rudzidatul.kl@utm.my</td> <td>Malaysia</td> <td></td> <td></td> </tr> </tbody> </table>	Drag to change order	Name	ID	Edit	Flag	Affiliation (edit for paper)	Email	Country	Email	Delete		Sharizal Fadlie Sabri	1264759			Malaysian Space Agency (MYSA), Malaysia Universiti Teknologi Malaysia, Malaysia Universiti Teknologi Malaysia, Malaysia Universiti Teknologi Malaysia	fadlie@mysa.gov.my	Malaysia				Noor Azurati Ahmad	236071			Malaysia Universiti Teknologi Malaysia, Malaysia Universiti Teknologi Malaysia, Malaysia Universiti Teknologi Malaysia	azurati@utm.my	Malaysia				Shamsul Sahibuddin	442663			Malaysia Universiti Teknologi Malaysia, Malaysia Universiti Teknologi Malaysia, Malaysia Universiti Teknologi Malaysia	shamsul@utm.my	Malaysia				Rudzidatul Dziyauddin	544357			Malaysia Universiti Teknologi Malaysia, Malaysia Universiti Teknologi Malaysia, Malaysia Universiti Teknologi Malaysia	rudzidatul.kl@utm.my	Malaysia		
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Title		<i>Dynamic Frequency Scheduling for CubeSat's On Board and Data Handling Subsystem</i>																																																		
Abstract		CubeSat is a small size satellite that provide cheaper option for manufacturer to have a fully operational satellite. Due to its size, CubeSat can only generate limited power and this will restrict its functionality. This research aims to improve CubeSat's power consumption by implementing Dynamic Voltage and Frequency Scaling (DVFS) technique to On Board and Data Handling subsystem (OBDH). DVFS will find the best operating frequency to execute all OBDH's task. In this paper, we explain on how we determined task set that represent all routine tasks executed by OBDH during normal operation mode. We have simulated the task set using two DVFS algorithm, Static Earliest Deadline First (EDF) and Cycle Conserving EDF (CC EDF). Result shows that both algorithms give similar result. However, when we configure the task set as non-preemptive, the simulator failed to schedule critical task. We conclude that we need to consider CubeSat as mixed-criticality system to prevent critical task from being aborted by the system.																																																		
Keywords		CubeSat; Scheduling Algorithm; Dynamic Frequency Scaling; simulation																																																		
Topics		Process Automation; Software Development for Instrumentation, Measurement and Control																																																		
Presenter(s)		presenter not specified																																																		
Registration		Noor Azurati Ahmad has registered and paid for NR:Professional																																																		
DOI																																																				
Appears in attendee proceedings and proceedings?		neither: copyright form missing																																																		

Status  [Accepted](#)  Notification email sent [Feb 14, 2020 17:40:10 Asia/Hong_Kong](#).

Notes 

Visa letter  none

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Reviewed Correction Table  Can upload [any number of pages](#) (type) until [track](#) deadline of [Apr 15, 2020 11:59:59 EDT](#).

Final manuscript  Can upload [any number of pages](#) (type) until [track](#) deadline of [Apr 15, 2020 11:59:59 EDT](#).

Personal notes



You are chair for this conference.

Reviews

6 Review1s

Review 1 (Reviewer A)

Reviewer [Vincenzo Piuri](#) (A); [completed](#); assigned [Dec 12, 2019 04:11:53 UTC](#) by [Robiah Ahmad](#); due [Feb 13, 2020 12:59:00 HKT](#)  ; last reminded [Dec 17, 2019 15:15:22 UTC](#); completed [Dec 17, 2019 17:20:23 UTC](#)      

Appropriateness for journal (Rate the paper organization, the clearness of text and figures, the completeness and accuracy of references for journal publication)	Adequacy of literature review (Sufficient literature has been done for the study)	Quality of research design (Demonstrates an extremely high level competence in selecting appropriate techniques/tools in solving problem and interpreting results. The research design and method of analysis reflected a sophisticated understanding of the research problem.)	Adequacy of data analysis (Systematically has been performed by ensuring data integrity, accurateness, and appropriate data analysis technique.)	Familiarity (Rate the familiarity you are with the topic of this paper.)	Final Reviewer Decision (Please select ONE only)	Contributions to the literature (The findings of the study contribute to the body of knowledge.)	Conceptual significance (Does the finding help the reader understand better?)	Practical significance (Explains the relevance of the study under consideration.)	Legitimacy of conclusions (Does the study in accordance with the laws of reasoning: logically inferable? How well does the author(s) conclude their work?)	Clarity of presentation & readability (Shows exceptional written communication skills with faultless grammar and spelling. Tables/diagrams/charts are appropriately labeled. An extremely independent candidate. Well organized paper structure.)
Excellent. (5)	Excellent. (5)	Excellent. (5)	Excellent. (5)	Expert (Currently work in this area and know the latest literature in the specific domain of this paper) (4)	Accept (1)	Excellent. (5)	Excellent. (5)	Excellent. (5)	Excellent. (5)	Excellent. (5)

Overall comments to the author (Recommended changes. Please indicate any changes that should be made to the paper if accepted.)

the paper presents an interesting approach to energy management for cube satellites. the dynamic adjustment of the voltage and frequency of operation as well as the data handling are effectively exploited to this purpose. analysis is accurate.

Reviewer Independency (I have had no recent associations with the authors, such as submitting or publishing a joint paper, being coworker, et similia (cf. IEEE Publication Services and Products Board Operations Manual, Sec. 8.2.2.B) (If statement is not true, specify association in "Confidential comments to the TPC").)

no association

Comments to the TPC (Confidential comments to the TPC (will be not sent to Authors))

see comments to authors

Review 2 (Reviewer B)

Reviewer [Mohammed K A Kaabar](#) (B); [completed](#); assigned [Dec 12, 2019 04:11:53 UTC](#) by [Robiah Ahmad](#); due [Feb 13, 2020 12:59:00 HKT](#)  ; last reminded [Dec 16, 2019 15:15:53 UTC](#); completed [Jan 6, 2020 06:03:40 UTC](#)      

Appropriateness for journal. (Rate the paper organization, the clearness of text and figures, the completeness and accuracy of references for journal publication)	Adequacy of literature review (Sufficient literature has been done for the study)	Quality of research design (Demonstrates an extremely high level competence in selecting appropriate techniques/tools in solving problem and interpreting results. The research design and method of analysis reflected a sophisticated understanding of the research problem.)	Adequacy of data analysis (Systematically has been performed by ensuring data integrity, accurateness, and appropriate data analysis technique.)	Familiarity (Rate the familiarity you are with the topic of this paper.)	Final Reviewer Decision (Please select ONE only)	Contributions to the literature (The findings of the study contribute to the body of knowledge.)	Conceptual significance (Does the finding help the reader understand better?)	Practical significance (Explains the relevance of the study under consideration.)	Legitimacy of conclusions (Does the study in accordance with the laws of reasoning; logically inferable? How well does the author(s) conclude their work?)	Clarity of presentation & readability (Shows exceptional written communication skills with faultless grammar and spelling. Tables/diagrams/charts are appropriately labeled. An extremely independent candidate. Well organized paper structure.)
Readable, but revision is needed in some parts. (3)	Readable, but revision is needed in some parts. (3)	Readable, but revision is needed in some parts. (3)	Well written. (4)	Good (Know the area well but may not be up to date on the latest literature) (3)	Accept after specified revision (2)	Readable, but revision is needed in some parts. (3)	Readable, but revision is needed in some parts. (3)	Well written. (4)	Readable, but revision is needed in some parts. (3)	Readable, but revision is needed in some parts. (3)

Overall comments to the author (Recommended changes. Please indicate any changes that should be made to the paper if accepted.)

This research paper discusses an important topic of study in the field of satellite communication. This paper provides a new study with good analysis of results. It also provides some recommendations for future design work that is being currently studied using all results from this research work. However, this paper suffers unfortunately at some parts from the lack of proper English (writing) editing, therefore, I would highly recommend going over this paper gain and edit all typos and grammatical errors in order to be accepted for the inclusion in the proceedings of this prestigious conference.

Reviewer Independency (I have had no recent associations with the authors, such as submitting or publishing a joint paper, being coworker, et similia (cf. IEEE Publication Services and Products Board Operations Manual, Sec. 8.2.2.B) (If statement is not true, specify association in "Confidential comments to the TPC").)

I fully confirm that I have had no recent associations with the authors, such as submitting or publishing a joint paper, being coworker, et similia (cf. IEEE Publication Services and Products Board Operations Manual, Sec. 8.2.2.B).

Comments to the TPC (Confidential comments to the TPC (will be not sent to Authors))

None

Review 3 (Reviewer C)

Reviewer [Mihaela Albu](#) (C); [completed](#); assigned [Dec 12, 2019 04:11:53 UTC](#) by [Robiah Ahmad](#); due [Feb 13, 2020 12:59:00 HKT](#) ; last reminded [Jan 17, 2020 03:16:09 UTC](#); [completed Jan 17, 2020 15:48:27 UTC](#)      

Appropriateness for journal. (Rate the paper organization, the clearness of text and figures, the completeness and accuracy of references for journal publication)	Adequacy of literature review (Sufficient literature has been done for the study)	Quality of research design (Demonstrates an extremely high level competence in selecting appropriate techniques/tools in solving problem and interpreting results. The research design and method of analysis reflected a sophisticated understanding of the research problem.)	Adequacy of data analysis (Systematically has been performed by ensuring data integrity, accurateness, and appropriate data analysis technique.)	Familiarity (Rate the familiarity you are with the topic of this paper.)	Final Reviewer Decision (Please select ONE only)	Contributions to the literature (The findings of the study contribute to the body of knowledge.)	Conceptual significance (Does the finding help the reader understand better?)	Practical significance (Explains the relevance of the study under consideration.)	Legitimacy of conclusions (Does the study in accordance with the laws of reasoning; logically inferable? How well does the author(s) conclude their work?)	Clarity of presentation & readability (Shows exceptional written communication skills with faultless grammar and spelling. Tables/diagrams/charts are appropriately labeled. An extremely independent candidate. Well organized paper structure.)
Readable, but revision is needed in some parts. (3)	Excellent. (5)	Well written. (4)	Well written. (4)	Some familiarity (Have general familiarity with the area) (2)	Accept after specified revision (2)	Well written. (4)	Well written. (4)	Well written. (4)	Readable, but revision is needed in some parts. (3)	Readable, but revision is needed in some parts. (3)

Overall comments to the author (Recommended changes. Please indicate any changes that should be made to the paper if accepted.)

Dear authors, the paper is well written. Please consider correcting some minor editing errors (for example: "All task is executed..."; "future works" etc.); Also, please consider explaining in more detail Figure 4 (it is not clear the scheduling, nor the gain compared with no scheduling case). Results from both SimSo and DVFS should have been shown even they do not differ). Please consider quantifying (in terms of potential energy saving) the results.

Reviewer Independency (I have had no recent associations with the authors, such as submitting or publishing a joint paper, being coworker, et similia (cf. IEEE Publication Services and Products Board Operations Manual, Sec. 8.2.2.B) (If statement is not true, specify association in "Confidential comments to the TPC").)

I have had no recent associations with the authors, such as submitting or publishing a joint paper, being coworker, et similia


Review 4 (Reviewer D)

Reviewer [Ali Rafiei](#) (D); **declined**; assigned [Dec 12, 2019 04:11:53 UTC](#) by [Robiah Ahmad](#); due [Feb 13, 2020 12:59:00 HKT](#) ; last reminded [Dec 14, 2019 15:15:23 UTC](#) 



Review 5 (Reviewer E)

Reviewer [Annisa Jamali, A.J.](#) (E); **completed**; assigned [Dec 12, 2019 04:11:53 UTC](#) by [Robiah Ahmad](#); due [Feb 13, 2020 12:59:00 HKT](#) ; last reminded [Jan 8, 2020 15:15:11](#)

[UTC](#); completed [Jan 9, 2020 06:51:25 UTC](#)      

Appropriateness for journal. (Rate the paper organization, the clearness of text and figures, the completeness and accuracy of references for journal publication)	Adequacy of literature review (Sufficient literature has been done for the study)	Quality of research design (Demonstrates an extremely high level competence in selecting appropriate techniques/tools in solving problem and interpreting results. The research design and method of analysis reflected a sophisticated understanding of the research problem.)	Adequacy of data analysis (Systematically data process has been performed by ensuring data integrity and appropriate data analysis technique.)	Familiarity (Rate the familiarity you are with the topic of this paper.)	Final Reviewer Decision (Please select ONE only)	Contributions to the literature (The findings of the study contribute to the body of knowledge.)	Conceptual significance (Does the finding help the reader understand better?)	Practical significance (Explains the relevance of the study under consideration.)	Legitimacy of conclusions (Does the study in accordance with the laws of reasoning; logically inferable? How well does the author(s) conclude their work?)	Clarity of presentation & readability (Shows exceptional written communication skills with faultless grammar and spelling. Tables/diagrams/charts are appropriately labeled. An independent candidate. Well organized paper structure.)
Readable, but revision is needed in some parts. (3)	Readable, but revision is needed in some parts. (3)	Readable, but revision is needed in some parts. (3)	Readable, but revision is needed in some parts. (3)	Some familiarity (Have general familiarity with the area) (2)	Accept after specified revision (2)	Readable, but revision is needed in some parts. (3)	Readable, but revision is needed in some parts. (3)	Readable, but revision is needed in some parts. (3)	Readable, but revision is needed in some parts. (3)	Readable, but revision is needed in some parts. (3)

Overall comments to the author (Recommended changes. Please indicate any changes that should be made to the paper if accepted.)

The work appears to be preliminary. The content of the research is too simple or brief.

Reviewer Independency (I have had no recent associations with the authors, such as submitting or publishing a joint paper, being coworker, et similia (cf. IEEE Publication Services and Products Board Operations Manual, Sec. 8.2.2.B) (If statement is not true, specify association in "Confidential comments to the TPC").)

true

Review 6 (Reviewer F)

Reviewer [Aisha-Hassan A. Hashim](#) (F); **notified**; assigned [Jan 6, 2020 02:05:54 UTC](#) by [Robiah Ahmad](#); due [Feb 13, 2020 12:59:00 HKT](#)       

EDAS at 172.30.0.206 (Tue, 21 Jul 2020 21:37:39 -0400 EDT) [User 1226085 using Win10:Chrome 84.0 cached 0.142/1.262 s] [Request help](#)