Innovative Solutions In Space

Want to work in Space?

ISIS - Innovative Solutions In Space BV is an ambitious and dynamic space company located in Delft, The Netherlands. As one of the CubeSat global market leaders, ISIS develops and sells advanced space systems and nanosatellites, provides worldwide launch services and satellite operations supporting a broad range of small satellite applications. Currently, ISIS employs over 90 space enthusiasts. To strengthen our multidisciplinary team in Delft we are hiring a:

AOCS – Control & Simulation Engineer (1.0 FTE)

As a member of our AOCS team, you will be responsible for the design, implementation and performance verification of attitude control algorithms and actuators. Building simulation models and contributing to the company's simulation framework is part of this function. Daily activities will range from implementing AOCS hardware and software in our satellite missions to performing research & development in the scope of the company's technology roadmap. You will actively contribute to the AOCS roadmap, and you will liaise with other teams in the company in a systems engineering context.

As AOCS control & simulation engineer you will be in a position to bring CubeSat AOCS solutions to a new level. The small satellite market is experiencing a trend where higher demands are placed on the accuracy and reliability of AOCS solutions and you will take part in realizing that. From the start, you will be working hands-on with both flight hardware and software.

We expect you to be ambitious, to be able to work autonomously and to take initiative where appropriate and to continuously strive to improve processes and efficiency in order to support all AOCS related activities within company.

Your main responsibilities:

- Designing AOCS control systems
- Simulating and analyzing AOCS performance
- Developing control software to be embedded on the satellite
- Developing simulation code and executing simulations for control performance verification
- Contribute to control hardware design on AOCS system- and subsystem level
- Drive AOCS subsystem development when applicable
- Co-own a satellite's pointing error budget

You will also be involved in:

- Supporting satellite sales to ensure technical offers sent to customers are sound and comply with ISIS's capabilities and AOCS roadmap
- Liaising with ISIS's embedded software team for implementation of AOCS algorithms
- Liaising with ISIS's systems engineering team to coordinate satellite level AOCS performance and in planning & supporting satellite test campaigns

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Prerequisites:

- An academic master's (MSc) degree or higher in; software engineering, space systems engineering, electronics / mechatronics or control engineering. Knowledge of control theory.
- At least several years (>2) of working experience, preferably in the space- or high-tech industry
- A solid grasp of mathematics, physics (dynamics) and numerical analysis
- Working experience with one or more of the following disciplines; electronics/mechatronics, (embedded) software engineering, filter & controller design, simulation
- Affinity with both mechatronic hardware and software
- Proficiency in one or more of the following programming and scripting languages; Matlab, C, C++ and Python.
- Good communication skills in English (spoken and written)

If you do not meet some of these requirements, the following may be taken into additional consideration by us;

The following will be considered as a plus:

- Knowledge of other programming languages will be considered beneficial
- A PhD in mathematics
- Knowledge of propulsion systems, orbit control and related orbital dynamics
- A solid understanding of digital communication buses (I2C, SPI, CAN, etc.)
- Experience with digital systems design

Want to apply?

ISIS offers you a challenging job within a multidisciplinary team of engineers. The company offers opportunities for education and training. ISIS has a strong international focus and is strategically located in Delft, The Netherlands. If you consider this position matches your professional experience and background as well as your personal interests please send your CV and letter of motivation via e-mail to: recruitment@isispace.nl.

Selected applicants applying from abroad will be able to participate in a first interview over digital communication such as Skype. In further selection rounds applicants may be asked to travel to ISIS's premises in person.

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Want to impress us?

In case you feel a letter of motivation does not quite get the message across, you can impress us by solving the following problem;

A satellite needs to perform a slew rotation maneuver of 180 degrees over the satellite's x-axis. The satellite is initially at rest, and needs to come to a full stop at the end of the maneuver. The satellite is equipped with a reaction wheel with its axis along the x-axis. The relevant parameters are the following:

Parameter	Value
Initial satellite angular rate [rad/s]	[0 0 0]
Initial wheel speed [rad/s]	0
Satellite inertia tensor [kgm^2]	$\begin{bmatrix} Ixx & Ixy & Ixz \\ Iyx & Iyy & Iyz \\ Izx & Izy & Ixx \end{bmatrix} = \begin{bmatrix} 0.07 & 0.0 & 0.0 \\ 0.0 & 0.05 & 0.0 \\ 0.0 & 0.0 & 0.01 \end{bmatrix}$
Wheel inertia [kgm^2]	1.0e-05
Wheel motor maximum torque [mNm]	1.5
Maximum motor/wheel speed [rpm]	3000

QUESTION: What is the minimum time within which this slew maneuver can be achieved?

Please send us your solution in PDF format, and include any code and/or any mathematical derivation you used. Also include your CV. The solution to the question must be clearly stated and justified.