



## OFERTA DE TRABAJOS FIN DE MASTER EN AIRBUS ALEMANIA

- Localización: Airbus Defence and Space – Friedrichshafen (Alemania)
- Duración: 6 meses (a partir de octubre de 2017)
- Remuneración: Mensual
- Solicitudes en <http://company.airbus.com/careers>

### REQUISITOS:

- ✓ Cursando MUSE ó MUIA (preferiblemente intensificación Vehículos Espaciales).
- ✓ Dominio de lenguajes de programación: Fortran (indispensable), Python.
- ✓ Áreas: Métodos Matemáticos, Mecánica Orbital.
- ✓ Nivel alto de inglés y conocimientos de alemán (aconsejable no imprescindible).

Descripción en las siguientes páginas:



MAKE IT POSSIBLE.  
MAKE IT HAPPEN.  
MAKE IT FLY.

## Final Thesis within Engineering: Optimisation of a Simulation Framework for Space Debris Observations

Reference Code 10367185 NU EN EXT 1

- Site:	Airbus Defence & Space Friedrichshafen (ex Astrium SL)
- Target Group:	Student
- Work Contract Type / Working Time:	Final-year thesis / Full time
- Start Date / Duration:	01.10.2017 / 6 MONTHS
- Work Experience:	Not specified
- Functional Area:	ENGINEERING / Design & Development
- Education:	Apprentice, Student / Engineering / Aerospace Engineering Apprentice, Student / Information Technology

*Airbus is a global leader in aeronautics, space and related services. In 2016, it generated revenues of € 67 billion and employed a workforce of around 134,000. Airbus offers the most comprehensive range of passenger airliners from 100 to more than 600 seats. Airbus is also a European leader providing tanker, combat, transport and mission aircraft, as well as Europe's number one space enterprise and the world's second largest space business. In helicopters, Airbus provides the most efficient civil and military rotorcraft solutions worldwide. Our people work with passion and determination to make the world a more connected, safer and smarter place. Taking pride in our work, we draw on each other's expertise and experience to achieve excellence. Our diversity and teamwork culture propel us to accomplish the extraordinary - on the ground, in the sky and in space.*

### Description of the job

Are you looking for a final year project? Would you like to discover the work within developing and improving a tool that uses real or simulated observations of space debris orbiting Earth? Then apply now! We look forward to you joining us at Airbus Defence and Space in Friedrichshafen.

Location: Friedrichshafen

Start: 01.10.2017

Duration: 6 months

Since the early days of spaceflight, space has become more and more crowded with active satellites and passive space debris. Over 600.000 objects >1 cm pose a risk for satellites and their mission. In order to be able to predict and avoid collisions, the orbits of objects in space must be known with sufficient accuracy. As passive debris such as rocket bodies do not have the means to determine their own orbit e.g. via GPS, their orbits must be determined through measurements. Different approaches can be used, e.g. radar measurements, telescope observations or laser tracking from ground and from space. By gathering a number of measurements of a target along its orbit one can predict and refine the object's orbital elements over time.

The objective of the work is to further develop and improve a tool that uses real or simulated observations of space debris orbiting Earth, performs an orbit determination and estimates the error of the prediction.

A baseline implementation of the tool already exists (Fortran code), enabling the assessment of different observation strategies for orbit determination and their usefulness.

## Tasks

Your exciting topic:

- Create a data base functionality for generating and maintaining a space object catalogue
- Implement an object cataloguing logic: Event-driven triggering of (already implemented) functions, e.g. initial orbit determination for unknown objects, orbit improvement for known objects, tasking of sensors in order to retrieve new measurements, etc.
- Optimise the implementation of the tool w.r.t. execution speed (i.e. optimise parallelisation, load balancing and implementation of algorithms) to enable efficient large-scale simulations
- Improve 3D visualisation capabilities

## Skills

You offer:

- Enrolled student (m/f) within Software-Engineering, Space-Engineering or similar field of study
- Programming skills (e.g. Fortran/C/Java/Python); familiarity with OpenMP
- Knowledge of database systems (e.g. SQL) and Service-Oriented Architectures (SOA) & middlewares
- Beneficial but not mandatory would be knowledge of visualisation techniques (e.g. NASA World Wind), numerical methods, orbital dynamics
- System-oriented thinking
- English: fluent

You are a good team player, have excellent communication skills, and are able to work independently.

## Contact

Does this job description fit your objectives and profile? Take the next step in your career and come and join us!

How to apply:

Online via [www.jobs.airbusgroup.com](http://www.jobs.airbusgroup.com)

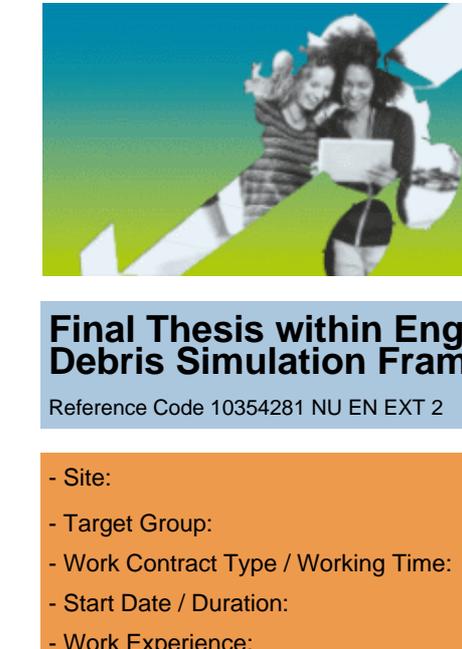
Reference number 10367185

Please provide the following documents: cover letter, C.V., relevant certificates, current certificate of enrolment

You can direct your cover letter to: Mr. Unterreitmeier

Should you have general questions regarding this position you can write an E-Mail to: [students.germany@airbus.com](mailto:students.germany@airbus.com)

Airbus is committed to achieving workforce diversity and creating an inclusive working environment. We welcome all applications irrespective of social and cultural background, age, gender, disability, sexual orientation or religious belief.



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## Final Thesis within Engineering: Augmentation of SPOOK - An Advanced Space Debris Simulation Framework

Reference Code 10354281 NU EN EXT 2

- Site:	Airbus Defence & Space Friedrichshafen (ex Astrium SL)
- Target Group:	Student
- Work Contract Type / Working Time:	Final-year thesis / Full time
- Start Date / Duration:	01.10.2017 / 6 MONTHS
- Work Experience:	Not specified
- Functional Area:	ENGINEERING / Design & Development
- Education:	Apprentice, Student / Engineering / Aerospace Engineering Apprentice, Student / Engineering / General Engineering Apprentice, Student / Mathematics

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### Description of the job

Are you looking for a final year project? Would you like to discover the work within Engineering? Then apply now! We look forward to you joining us at Airbus Defence and Space.

Location: Friedrichshafen

Start: 01.10.2017

Duration: 6 months

Since the early days of spaceflight, space has become more and more crowded with active satellites and passive space debris. Over 600.000 objects >1 cm pose a risk for satellites and their mission. In order to be able to predict and avoid collisions, the orbits of objects in space must be known with sufficient accuracy. As passive debris such as rocket bodies do not have the means to determine their own orbit e.g. via GPS, their orbits must be determined through measurements. Different approaches can be used, e.g. radar measurements, telescope observations or laser tracking from ground and from space. By gathering a number of measurements of a target along its orbit one can predict and refine the object's orbital elements over time.

The objective of the work is to further develop and improve a tool that uses real or simulated observations of space debris orbiting Earth, performs an orbit determination and estimates the error of the prediction.

A baseline implementation of the tool already exists (Fortran code), enabling the assessment of different observation strategies for orbit determination and their usefulness.

Focus of the thesis is to advance the tool further, implement new algorithms and methods, perform the simulation of observation scenarios and evaluate the results.

### Tasks

Your exciting topic:

- Augment a tool that simulates observations of space debris orbiting Earth, performs orbit determination and estimates the error of the prediction
- Develop and implement new algorithms and methods, perform the simulation of observation scenarios and evaluate the results

## Skills

You offer:

- Enrolled student (m/f) within Space-Engineering, Software-Engineering, Numerical Mathematics or similar field of study
- Programming skills (e.g. Fortran/C/Java) are required;
- Beneficial are knowledge of database systems (e.g. SQL) and visualisation techniques (e.g. NASA World Wind)
- System-oriented thinking
- Numerics, orbital dynamics
- English: advanced
- German: good

You are a good team player, have excellent communication skills, and are able to work independently.

## Contact

Does this job description fit your objectives and profile? Take the next step in your career and come and join us!

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Reference number 10354281

Please provide the following documents: cover letter, C.V., relevant certificates, current certificate of enrolment

You can direct your cover letter to: Mr. Unterreitmeier

Should you have general questions regarding this position you can write an E-Mail to: [students.germany@airbus.com](mailto:students.germany@airbus.com)

Airbus is committed to achieving workforce diversity and creating an inclusive working environment. We welcome all applications irrespective of social and cultural background, age, gender, disability, sexual orientation or religious belief.