

COMPUTER AIDED DESIGN AND SIMULATION OF REMOTELY
OPERATIONAL UNDERWATER VEHICLE (ROV)

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**COMPUTER AIDED DESIGN AND SIMULATION OF REMOTELY
OPERATIONAL UNDERWATER VEHICLE (ROV)**

by

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the requirement for award of the degree of
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**Department of Maritime Technology
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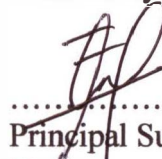


**DEPARTMENT OF MARITIME TECHNOLOGY
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**DECLARATION AND VERIFICATION REPORT
 FINAL YEAR RESEARCH PROJECT**

It is hereby declared and verified that this research report entitled: **COMPUTER AIDED DESIGN AND SIMULATION OF REMOTELY OPERATIONAL UNDERWATER VEHICLE (ROV)** by **HAIRUL ASYRAF BIN AHMAD**, Matric No. **UK 21179** has been examined and all errors identified have been corrected. This report is submitted to the Department of Maritime Technology as partial fulfilment towards obtaining the Degree **APPLIED SCIENCE (MARITIME TECHNOLOGY)**, Faculty of Maritime Studies and Marine Science, Universiti Malaysia Terengganu.

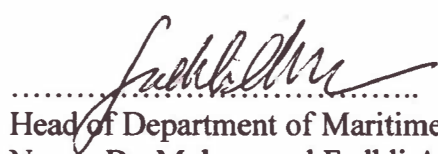
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DECLARATION

I hereby declare that this thesis entitled Computer Aided Design and Simulation of Remotely Operational Underwater Vehicle (ROV) is the result of my own research except as cited in the references.

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COMPUTER AIDED DESIGN AND SIMULATION OF REMOTELY OPERATIONAL UNDERWATER VEHICLE (ROV)

ABSTRACT

Advancements in technology in this day and age have led to the creation of robots to increase work efficiency and reduce human works. Remotely operated underwater vehicles (ROVs) are unoccupied, highly manoeuvrable tethered underwater robots that operate with response to human commands. They are made for underwater exploration and documentation, recoveries, inspections, search and rescue, trenching, cable burial and much more. This thesis discussed about the different designs of micro class Remotely-Operated Vehicle (ROV) and its simulation performance to operate in shallow water. The objectives of this study are to develop a micro class remotely operated vehicle (ROV), to propose five designs that able to fulfil its mission requirements and to analyze the performance of the candidate designs in terms of its resistance and hydrostatics using simulation software. The study is conducted based on theoretical modelling and simulation software to determine the best ROV design and its performance in a shallow water environment. All of the designs are created and fulfilled the requirements needed of a basic ROV. To summarize, the best design is selected after some data comparison generated from the analysis of several factors like pressure, velocity and drag coefficient. Some recommendation and suggestion were also made so that it can be applied in order to produce better and much more superior designs of a micro class ROV in the future.

REKABENTUK BERBANTUKAN KOMPUTER DAN SIMULASI KENDERAAN AIR KENDALIAN JARAK JAUH (ROV)

ABSTRAK

Kemajuan dalam bidang teknologi zaman ini telah menyumbang kepada penciptaan robot-robot untuk meningkatkan kecekapan kerja dan mengurangkan tenaga manusia. Kenderaan bawah air kendalian jarak jauh (ROV) tidak mempunyai pemandu, dan mudah dikawal oleh manusia ketika beroperasi di dalam air. Ia dicipta untuk eksplorasi dan dokumentasi bawah air, pemulihan, pemeriksaan, mencari dan menyelamatkan, pengendalian kabel dan banyak lagi. Kertas kerja ini membincangkan tentang reka bentuk ROV kelas mikro yang berbeza dan simulasi terhadap prestasi setiap reka bentuk ketika beroperasi di kawasan air cetek. Objektif kajian ini adalah untuk menghasilkan lima reka bentuk ROV yang berbeza dan menganalisis setiap reka bentuk dari segi rintangan dan hidrostatik dengan menggunakan perisian simulasi. Kesemua reka bentuk telah dihasilkan dan memenuhi kriteria asas sesebuah ROV. Reka bentuk yang terbaik telah dipilih setelah membuat perbandingan data hasil daripada analisis beberapa faktor seperti tekanan, halaju dan pekali seretan. Beberapa cadangan dan saranan telah dibuat supaya boleh digunakan untuk menghasilkan reka bentuk ROV kelas mikro yang lebih baik dan unggul di masa hadapan.