



AVANTHI INSTITUTE OF ENGINEERING AND TECHNOLOGY

(Approved by A.I.C.T.E., New Delhi, & Permanently Affiliated to J.N.T.U.K., Kakinada)

NAAC "B++" Accredited Institute

Cherukupally (Village), Near Tagarapavalasa Bridge, Bhogapuram (Mandal), Vizianagaram -531162.

www.aietta.ac.in, principal@aietta.ac.in

Cherukupally,
Date: 15.03.2022

From
The Principal,
Avanthi Institute of Engineering and Technology,
Cherukupally (Village)

To
Managing Director
Teck Team Solutions
Door No 1-20/1,Pulagalipalem,pendurthi
Visakhapatnam-531173

Dear Sir,

Sub.: Request to provide us with consultancy work-Reg.

We, Avanthi Institute of Engineering and Technology, are pleased to introduce ourselves as an emerging concern in the field of engineering education and software services. Avanthi Institute of Engineering and Technology is a professionally managed by a team of enthusiastic and qualified development team.

We humbly request you for an opportunity to prove ourselves by providing us project consultancy work.

Looking forward for your positive response.

Thank you



Copy to ECE HOD

Principal

AVANTHI INSTITUTE OF ENGG. & TECH
Cherukupally (V), Chittivalasa (SAO)
Bhogapuram (M),
Vizianagaram (Dist.)-531162

Work-Order for Research Project

Date 4th April 2022,

Company Name: Teck Team Solutions,

Work Provider: Mr. Nallamilli Venkata Reddy, CEO

Faculty Name & address:

Mrs K.Syamala,

Associate Professor,

Avanathi Institute of Engineering and Technology,

Department of Electronics and Communication Engineering,

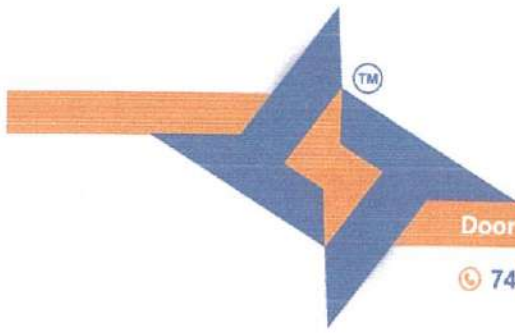
Email : syamala.kanchimani@gmail.com

Phone : 9849591737

We feel happy to inform you that the project proposal "CT and MRI Enhancement Based on Image Fusion Techniques" has been accepted as a research work to, Mrs K.Syamala Associate Professor, Department of ECE. your services are retained for a period of 15 months on temporary basis and you are not entitled to claim the permanency of the employment or the developed project. This agreement will be between Mrs K.Syamala, Associate Professor, Avanathi Institute of Engineering and Technology, & Teck Team Solutions and cannot be shared to other third party. Your services are taken on the following terms and conditions:

Business Terms:

Teck Team Solutions is a Training & Innovative Product development firm. The company is registered in India at Visakhapatnam, which provides training on Industry 4.0 technologies in the domain of Electronics, Student Entrepreneurs, Innovation Challenges and also Entrepreneurship skill development among youth. The company is a platform to explore their innovative ideas into reality The Company focuses on the design, development and production of innovative products which are useful and identified as need for the society in different ways. TTS initiated product development and is continuously working in R & D with innovative thinking that involves Bio-medical applications.



TECK TEAM SOLUTIONS

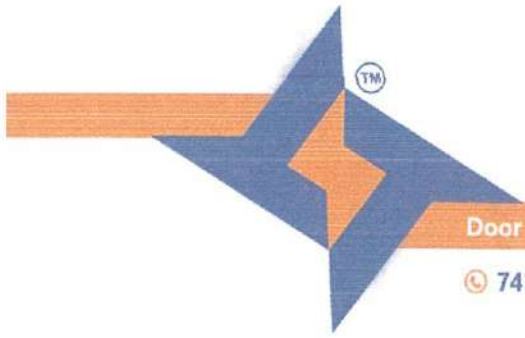
A Training & Product Development Firm

Door No 1-20/1, Pulagalipalem, Pendurthi (M), Visakhapatnam (D) - 531173

☎ 7416067555 ✉ teckteams@gmail.com 🌐 www.teckteamsolutions.com

Terms & Conditions:

1. The assigned task is to be completed in the specified time and the time schedule is to be maintained as per the terms of the company.
2. A report on the work is to be submitted every two weeks to be Teck Team Solutions to check the progress of work till the completion of the project.
3. A final report is to be submitted after the completion of the project and assure that the work is kept confidential.
4. The link/hard copy of the work is to be communicated through proper communication media as per our discussion.
5. The researcher is not permitted to approach directly or indirectly the client and solicit services with the client by circumventing Teck Team Solution and without written permission from the company.
6. The payments are made directly from Teck Team Solutions.
7. The project is sanctioned for a period of Fifteen Months and the extension of the project period if needed will be sanctioned up two months based on the work progress.
8. The project is sanctioned for an amount of Rs1, 30,000/- (One Lakh Thirty thousand) rupees only.
9. Full amount payment shall be made on one time basis to the researcher strictly after completion and submission of all the necessary documents as per the terms of Teck Team Solutions.
10. Project is to be explained to our team, one month prior to the sanctioned time as a pretest service and be available on month after completion as post-service.
11. Any clarifications related to the work or terms can be clarified at Teck Team Solutions as per the requirements.
12. Data related to the work should be legally protected and should not disclose or share the information to the others under any circumstances.



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13. It is necessary to maintain the hard/soft copy of signed invoice. Also, mention the Bank Name, Account Number and Branch Details, IFSC along with the mailing address, Contact number, PAN Card, & Service Tax Number if applicable.

Contact person

Mr. Nallamilli Venkata Reddy,

Cell: +91 7416067555

Email: info@teckteams.com

Website: <https://teckteamsolutions.com/>

For

Authorized signatory

All the terms and conditions are read and I have understood all the implications thereof. I agree to the above terms and conditions and in token of my acceptances I hereby affix the signature/acknowledge to this document.


Mrs K.Syamala

Associate Professor,

Avanthi Institute of Engineering Technology,

Vizianagaram, Andhra Pradesh.





Mr. Nallamilli Venkata Reddy,

Founder & CEO,

Teck Team Solutions,

Visakhapatnam, Andhra Pradesh.





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Cherukupally,
Date: 7.04.2022

From
The Principal,
Avanathi Institute of Engineering and Technology,
Cherukupally.

To
Managing Director
Teck Team Solutions
Door No 1-20/1, Pulagalipalem, pendurthi
Visakhapatnam-531173

Respected sir,

Sub: Under taking Project Development.....

Ref: Your letter dated

At the outset, I would like to thank you for your offer. As you are aware, Avanathi Institute of Engineering and Technology is a growing organization and has been thinking of having tie-ups with industry for our various branches of Engineering and technology. Infact Institution – Industry and co-operation is the most talked about subject in seminars and workshops.

After assessing our strengths, I have earmarked the Electronics and Communication Engineering Department of this institute to be our outsourcing partner. The department is adequately staffed and necessary infra structure.

Thanking you

Principal

PRINCIPAL

AVANTHI INSTITUTE OF ENGG. & TECH
Cherukupally (V), Chittivalasa (SAO)
Bhogapuram (M),
Vizianagaram (Dist.)-531162

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Cherukupally,
Date: 12.05.2022

From
The Principal,
Avanathi Institute of Engineering and Technology,
Cherukupally.

To
Managing Director
Teck Team Solutions
Door No 1-20/1,Pulagalipalem,pendurthi
Visakhapatnam-531173

Respected sir,

Sub: Project Development Team. I'm pleased to depute.

1. Mrs.K.Syamala
2. Ms.B.Pravallika

For the necessary work.

Thanking You,

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Principal

PRINCIPAL

AVANTHI INSTITUTE OF ENGG. & TECH
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Bhogapuram (M),
Vizianagaram (Dist.)-531162



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Cherukupally,

Date: 14.06.2022

The Principal,
Avanathi Institute of Engineering and Technology,
Cherukupally (Village)

To
Managing Director
Teck Team Solutions
Door No 1-20/1, Pulagalipalem, pendurthi
Visakhapatnam-531173

Respected sir,

Sub: Project Development--Reg

Ref: Your letter dated

The idea is to give exposure to our faculty and students to the actual software development environment.

The consultancy in the initial phase is not very keen on income generation. As such, we have no problem in accepting your quotation for Rs 1,30,000/- (One lakh Thirty Thousand only)

Thanking you,

Principal

PRINCIPAL

AVANTHI INSTITUTE OF ENGG. & TECH
Cherukupally (V), Chittivalasa (SAO)
Bhogapuram (M),
Vizianagaram (Dist.)-531162

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www.aietta.ac.in, principal@aietta.ac.in

Cherukupally,

Date: 09.06.2023

From
The Principal,
Avanthi Institute of Engineering and Technology,
Cherukupally.

To
Managing Director
Teck Team Solutions
Door No 1-20/1, Pulagalipalem, pendurthi
Visakhapatnam-531173

Respected Sir,

Sub: Project Completion -- Testing reg.

The project has been executed and completed. It has already been tested with the test data provided.

Now, I request you to provide necessary facilities for the team to complete the testing to the limits of your satisfaction.

The team will visit your location on 12.06.2023.

Thanking you,



Principal

PRINCIPAL

AVANTHI INSTITUTE OF ENGG. & TECH
Cherukupally (V), Chittivalasa (SAO)
Bhogapuram (M),
Vizianagaram (Dist.)-531162



Project Report: CT and MRI Enhancement Based on Image Fusion Techniques

1. INTRODUCTION:

The project aimed to improve the quality and diagnostic capabilities of medical images obtained from Computed Tomography (CT) and Magnetic Resonance Imaging (MRI) modalities through image fusion techniques. Image fusion is a process of combining information from multiple images to create a single, enhanced image with enhanced contrast, sharpness, and overall diagnostic value. By fusing CT and MRI images, clinicians can gain a more comprehensive understanding of the patient's condition, leading to more accurate diagnoses and better treatment planning.

2. OBJECTIVES:

The main objectives of the project were as follows:

- To explore various image fusion techniques suitable for CT and MRI images.
- To implement and compare different image fusion methods to determine their effectiveness.
- To assess the improvement in image quality and diagnostic value after applying image fusion techniques.

3. METHODOLOGY:

3.1 Data Collection:

- CT and MRI datasets were collected from the medical imaging department, ensuring that they correspond to the same patient and anatomical region.

3.2 Image Pre-processing:

- The collected images were pre-processed to ensure consistent resolution, orientation, and intensity scaling.

3.3 Image Fusion Techniques: Several image fusion techniques were explored and implemented, including but not limited to:

- Intensity-based Fusion: Combining pixel intensities from both CT and MRI images.
 - Wavelet Transform-based Fusion: Utilizing wavelet decomposition to fuse high-frequency details and low-frequency information.
 - PCA-based Fusion: Employing Principal Component Analysis to combine information from different modalities.
 - Deep Learning-based Fusion: Implementing convolutional neural networks (CNNs) for image fusion.
-



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3.4 Image Quality Evaluation:

- Objective metrics such as Structural Similarity Index (SSI), Peak Signal-to-Noise Ratio (PSNR), and Mean Squared Error (MSE) were used to quantitatively assess the quality of the fused images.
- Subjective evaluation was performed by experienced radiologists to assess the diagnostic value and visual appearance of the fused images.

4. RESULTS:

- The implemented image fusion techniques were evaluated on the collected CT and MRI datasets.
- Objective metrics indicated that certain image fusion methods outperformed others in terms of image quality and similarity to ground truth images.
- Subjective evaluation by radiologists demonstrated that some fusion techniques provided better visual interpretation and diagnostic value.

5. DISCUSSION:

The project highlighted the significance of image fusion techniques in enhancing the information content and diagnostic value of medical images from different modalities. The evaluation of different fusion methods showed that each technique had its strengths and limitations, with no one-size-fits-all solution. The selection of the appropriate fusion technique depends on the specific clinical requirements and the nature of the CT and MRI datasets.

6. CHALLENGES AND LIMITATIONS:

- Selection of the most suitable fusion method for a given dataset remains a challenge, as it relies on empirical testing and expertise.
- Availability of large and diverse datasets for training deep learning-based fusion methods can be a limiting factor.

7. CONCLUSION:

The project successfully demonstrated the potential of image fusion techniques to enhance CT and MRI images, providing clinicians with better insights for diagnosis and treatment planning. Image fusion holds promise for improving medical imaging capabilities and contributing to more accurate and efficient healthcare practices.

8. FUTURE RECOMMENDATIONS:

- Further exploration and optimization of deep learning-based fusion techniques can potentially yield more advanced and robust results.
- Collaborating with medical professionals to conduct clinical studies and evaluate the impact of fused images on patient outcomes would be valuable.




PRINCIPAL

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UTILITY CERTIFICATE

We, the undersigned, Principal Investigator and Co-Investigators of the CT and MRI Enhancement project being carried out at Avanthi Institute of Engineering and Technology – Electronics and Communication Engineering Department, hereby certify that we have examined the financial details provided for the project as follows:

S. No	Company Name	Project Name	Project Cost
1	Teck Team Solutions	CT and MRI Enhancement Based on Image Fusion Techniques	Rs. 1,30,000/-

We confirm that the aforementioned rates are reasonable and necessary for carrying out the mentioned tasks efficiently. We assure you that these rates will be utilized in the best possible manner to achieve optimal results in this project. Furthermore, we ensure complete transparency and accountability in all our financial transactions related to this project.

Please let us know if any additional information is required from our end. We look forward to your continued support and cooperation.

Thanking You,

Yours sincerely,


Mrs. K. Syamala

Principal Investigator


Ms. B. Pravallika

Co-Investigator

Electronics and Communication Engineering Department

INVOICE

DATE:
22-06-2023

INVOICE #
AIET/R&D/001

TO: Teck Team Solutions
#1-20/1
Pulagalipalem,
Pendurthi,
Visakhapatnam – 531173.

QTY	DESCRIPTION	UNIT PRICE	LINE TOTAL
1	CT and MRI Enhancement Based on Image Fusion Techniques	1,30,000	1,30,000
SUBTOTAL			1,30,000
SALES TAX			0.00
TOTAL			1,30,000



R&D HEAD SIGNATURE

R & D CO-ORDINATOR
AVANTHI INSTITUTE OF ENGG. & TECH.
Cherukupally (V), Near Tagarapuvalasa Bridge
Bhogapuram (M), Vizianagaram (D)-531162



AVANTHI INST. OF ENGG & TECH.,

Accounts Officer

AUTHORIZED SIGNATORY

AVANTHI INSTITUTE OF ENGINEERING AND TECHNOLOGY
CHERUKUPALLY (VILLAGE) | NEAR TAGARAPUVALASA BRIDGE | BHOGAPURAM (MANDAL) | VIZIANAGARAM-531162



C L A S S I C

PLOT NO 6 130/8, NARAYANA COMPLEX, BRTS EXPRESS WAY,
PENDURTHI, VISAKHAPATNAM-531 173, ANDHRA PRADESH
RTGS / NEFT IFSC : HDFC0009604

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Rupees रुपये *One lakh fifteen thousand only*

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For TECK TEAM SOLUTIONS

Payable at par through clearing/transfer at all branches of HDFC BANK LTD.

N. Venkata Reddy
Authorised Signatories

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