# Internship Opportunity
## in Intelligent Mesh Generation

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We are **deepmath**, a deeptech startup based in Nantes, France, boasting key partnerships around the world. Nestled within the Centrale-Audencia-ENSA incubator, with strategic support of the innovation hub Atlanpole, financial support from BPI France, and in collaboration with the GeM laboratory of ECN, we are excited to offer a master's internship opportunity aimed at developing disruptive technologies for the engineering simulation market. Our current flagship project is pioneering an intelligent mesh generator. If you are driven by innovation and ready to overcome technological challenges, we invite you to apply and join our journey !

## 1 About Us

**deepmath** gathers state-of-the-art techniques in mathematical modeling, including the resolution of physical equations, statistical events simulations, and artificial intelligence. We provide the industry with either high-fidelity or real-time, description and prediction, of statistical processes and physical phenomena. Our company possesses a dual vocation as both a provider of tool-based services, and a developer of new groundbreaking technologies. We offer our first services to the wind energy and offshore engineering markets, and develop our first technologies to the engineering simulation market.

## 2 The Project

For decades, mesh generation and adaptiveness have been significant bottlenecks in Computer-Aided Engineering (CAE) and Computational Fluid Dynamics (CFD) workflows. Mesh quality is paramount for ensuring accurate, reliable, and efficient results in engineering simulation. As a consequence, engineers can often invest over 50% of their time in mesh generation. Still, despite the intense business value and academic efforts, the mesh generation process for CAE and CFD applications remains iterative, time consuming, and often produce sub-optimal results.

Intelligent Mesh Generation (IMG) employ modern artificial intelligence techniques to enhance or substitute traditional rule-based algorithms. Many different IMG techniques recently emerge and draw considerable attention from the scientific community, by enhancing generalizability, robustness, and practical utility of traditional mesh generation techniques. **deepmesh** is an IMG application based on state-of-the-art artificial intelligence techniques to redefine the way engineers approach simulation.

## 3 Your Missions

You will integrate our development team to design the first proof-of-concept of our IMG technology. Working closely with the founding team, you will refine the technological concept and spearhead its implementation. The specific objectives include:

- Perform a comprehensive literature review on IMG technologies ;
- Assess our current concept against existing state-of-the-art solutions ;
- Explore and evaluate various machine learning architectures and training methodologies ;
- Initiate the construction of a robust training dataset.

These constitute a feasible set of objectives for a 6-months internship, but the list is non-exhaustive. Joining a startup in its early development stage, you will be poised to make a significant impact on the project's outcomes and development strategy, including your mission.

## 4 Your profile

We are looking for a passionate and innovative individual. The ideal candidate possesses:

**Hard Skills**

- Currently pursuing or recently completed a Master's degree in Computer Science, Applied Mathematics, Engineering, or a related field ;
- Proficiency in programming languages such as Fortran, C++, Python, or others relevant to engineering or AI; Knowledge of libraries employed in simulation or AI is a differential.
- Conversational fluency in spoken French or English; Writing and reading fluency in English.

**Soft Skills**

- Strong foundation and passion for mathematical models in physics and computer science ;
- Previous experience or a keen interest in engineering simulation, machine learning, artificial intelligence, and related technologies ;
- An entrepreneurial spirit, willing to take initiative and work collaboratively in a fast-paced startup environment ;
- Excellent problem-solving skills and creative thinking ;

## 5 Your professional outcomes

You will contribute to groundbreaking advancements in Intelligent Mesh Generation technology and pave the way for a wealth of professional opportunities, such as:

- Demonstrate your abilities and ambition within a growing startup environment ;
- Enhance your technical skills and knowledge while gaining valuable experience in innovative research and development within the industry;
- Grow with the company to lead projects, mentor peers, and shape the strategic direction of our technological development ;
- Take charge of initiatives and see your ideas evolve from conception to implementation ;

## 6 A Vibrant and Supportive Work Environment

We're cultivating a work atmosphere that promotes well-being and creativity. Here's what you can expect as part of our team:

- Your ideas and contributions are valued and everyone's voice is heard. Our culture encourages the free exchange of ideas and supports team members in achieving collective goals.
- We understand the importance of work-life balance. Enjoy flexible work hours that help you manage your personal and professional lives effectively.
- Stay at the forefront of your field with access to learning resources, conferences, and workshops that will keep your skills sharp and your mind engaged.
- Being located within the Centrale-Audencia-ENSA incubator gives access to academic resources, research collaborations, and a vibrant community of thinkers and innovators.

## 7 Final word

If you're ready to dive into a world where your work will shape the future of engineering simulation technology, we're eager to hear from you. Please send your CV and a cover letter that tells your story and showcases your passion to liadpaskin@deepmath.tech. We welcome not just a resume, but a glimpse into what drives you professionally.

Looking forward to know you better, *The Founders*.