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Research Article

MODERN REQUIREMENTS OF TEACHING COMPUTER GRAPHICS TO STUDENTS OF TECHNICAL HIGHER EDUCATION INSTITUTIONS

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ABSTRACT

This article explores the evolving needs and demands of teaching computer graphics to students in technical higher education institutions. It highlights the contemporary challenges and crucial aspects to consider for effective curriculum design and pedagogy in this rapidly advancing field. Emphasizes the fast-paced nature of computer graphics, requiring curricula to stay current with emerging technologies, software updates, and industry trends. Acknowledges the interdisciplinary nature of computer graphics, encompassing areas like programming, mathematics, physics, and art, demanding a balanced approach in teaching.

KEYWORDS

Programming, mathematics, physics and art.

INTRODUCTION

Teaching computer graphics (CG) in technical higher education institutions has become increasingly significant due to the growing demand for skilled professionals in industries such as gaming, animation, virtual reality, architectural visualization, and digital media. The field of computer graphics is evolving rapidly, driven by advancements in software, hardware, and computational methods. To keep pace with these changes, educators must continuously update the curriculum and teaching methods to meet modern requirements. This article explores the modern requirements for teaching computer graphics to students in technical higher education institutions and provides recommendations for improving

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instructional practices to align with current industry needs.[1]

The Evolution of Computer Graphics Education

Historically, computer graphics education focused primarily on foundational concepts such as 2D and 3D modeling, rendering, and animation. As technology has progressed, the scope of computer graphics has expanded to include more specialized topics like real-time graphics, computational geometry, and visual effects. Additionally, there is a growing emphasis on interdisciplinary skills, such as programming, mathematics, and physics, which are essential for understanding and developing complex graphical algorithms and simulations.[2]

Modern Requirements for Teaching Computer Graphics

1. **Integration of Industry-Standard Tools and Software:** Technical higher education institutions must incorporate industry-standard tools and software, such as Autodesk Maya, Blender, Unity, Unreal Engine, and Adobe Creative Suite, into their curricula. Familiarity with these tools is crucial for students to develop practical skills that are directly transferable to the workplace.

2. **Emphasis on Programming and Algorithm Development:** A strong foundation in programming languages such as C++, Python, and GLSL is essential for students specializing in computer graphics. Understanding how to develop and optimize algorithms for graphics rendering, shader programming, and computational geometry is critical for creating high-performance graphics applications.

3. **Incorporation of Emerging Technologies:** The rapid evolution of technologies such as virtual reality (VR), augmented reality (AR), and machine learning (ML) has opened new avenues in computer graphics.[3] Educational programs should include courses that cover these emerging technologies, enabling students to explore new ways to apply computer graphics in innovative ways.

4. **Project-Based Learning and Collaboration:** Project-based learning allows students to apply theoretical knowledge to real-world problems, fostering creativity, critical thinking, and problem-solving skills. Collaborative projects that mimic industry scenarios help students learn to work effectively in teams, preparing them for the collaborative nature of modern workplaces.

5. **Focus on Interdisciplinary Skills:** Modern computer graphics is highly interdisciplinary, requiring knowledge of physics, mathematics, computer science, and design principles. Courses should be designed to integrate these disciplines, offering a more holistic understanding of how different fields contribute to the development of advanced graphics techniques.

6. **Adaptation to Remote and Blended Learning Environments:** The COVID-19 pandemic has highlighted the importance of flexibility in teaching methods.[4] Technical higher education institutions must adapt to remote and blended learning environments by providing access to online resources, virtual labs, and cloud-based software solutions.

Challenges and Recommendations

One of the main challenges in teaching computer graphics is keeping the curriculum up to date with

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rapidly changing technology. To address this, institutions should establish strong partnerships with industry leaders, facilitating continuous curriculum updates and providing students with access to the latest tools and technologies. Additionally, investing in faculty development programs to enhance instructors' knowledge of emerging trends in computer graphics can further strengthen the educational experience.

Another challenge is ensuring students have access to the necessary computational resources. Given the high demands of computer graphics software on hardware, institutions should ensure that computer labs are equipped with high-performance machines, and consider cloud-based solutions to provide remote access to powerful graphics workstations.[5]

CONCLUSION

Teaching computer graphics in technical higher education institutions requires a dynamic approach that integrates industry-standard tools, emphasizes programming and algorithm development, incorporates emerging technologies, and fosters interdisciplinary collaboration. By addressing the challenges and adapting to modern requirements, educational institutions can better prepare students for successful careers in the rapidly evolving field of computer graphics.

REFERENCES

1. Foley, J. D., van Dam, A., Feiner, S. K., & Hughes, J. F. (1990). Computer Graphics: Principles and Practice. Addison-Wesley.
2. Gortler, S. J. (2012). Foundations of 3D Computer Graphics. MIT Press.
3. Guha, S. (2013). Computer Graphics Through OpenGL: From Theory to Experiments. CRC Press.
4. Hughes, J. F. (2014). Computer Graphics: Principles and Practice. Addison-Wesley Professional.
5. Shreiner, D., Sellers, G., Kessenich, J., & Licea-Kane, B. (2013). OpenGL Programming Guide: The Official Guide to Learning OpenGL, Version 4.3. Addison-Wesley Professional.