


COMPUTER GRAPHICS, DESIGN & ANALYSIS: INTRODUCTION

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2 OBJECTIVE

- **Poverty, Value Addition, Theory Practice**
Audio of a recent graduate. No theory, no practice.
 - **Syllabus, Coverage & Scope**
See the Old Syllabus on the next Page. I will add the new after this class. However, most of what you have in both will be covered from an applications viewpoint.
 - **Software & Books Required**
Autodesk Fusion 360, Wolfram Research Mathematica, StudioElle MASC Software
 - **Test One: Week 3. Scope and Preparation**
Pages 1-68 Lai, Rubin & Liu; The next test, three weeks later will be announced.
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3 THE OLD, THE NEW

- In our old syllabus, this course was called “Numerical Simulation in Design”. In the new, it is called “Computer Graphics”.
- Numerical Simulation in Design covers a lot of space in Graphics but it did not stop there. The spirit of that coverage will guide this course. A lot of graphics – but it will be applied to design.
- First listen to the an 18 minute interview I conducted with a recent university graduate.



4 PRECIS OF AUDIO



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- What is taught here is **just theory**. No practical applications, no equipment, no experience, not useful.
 - Examples in Programming and Distillation Theories.
 - I asked him to give me one programming theory he knows. I posed a theory question on Distillation. You can hear the response to both.
 - It is NOT possible to KNOW only theory. If you know theory, there is some application that guides that knowledge. When that is absent, you know NOTHING!
 - Wants to go “Abroad” where things are better.
 - I asked where is “Abroad”: Vietnam? Somalia, Syria, Venezuela or North Korea.

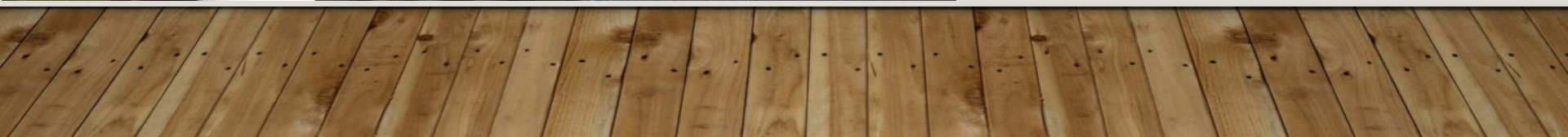
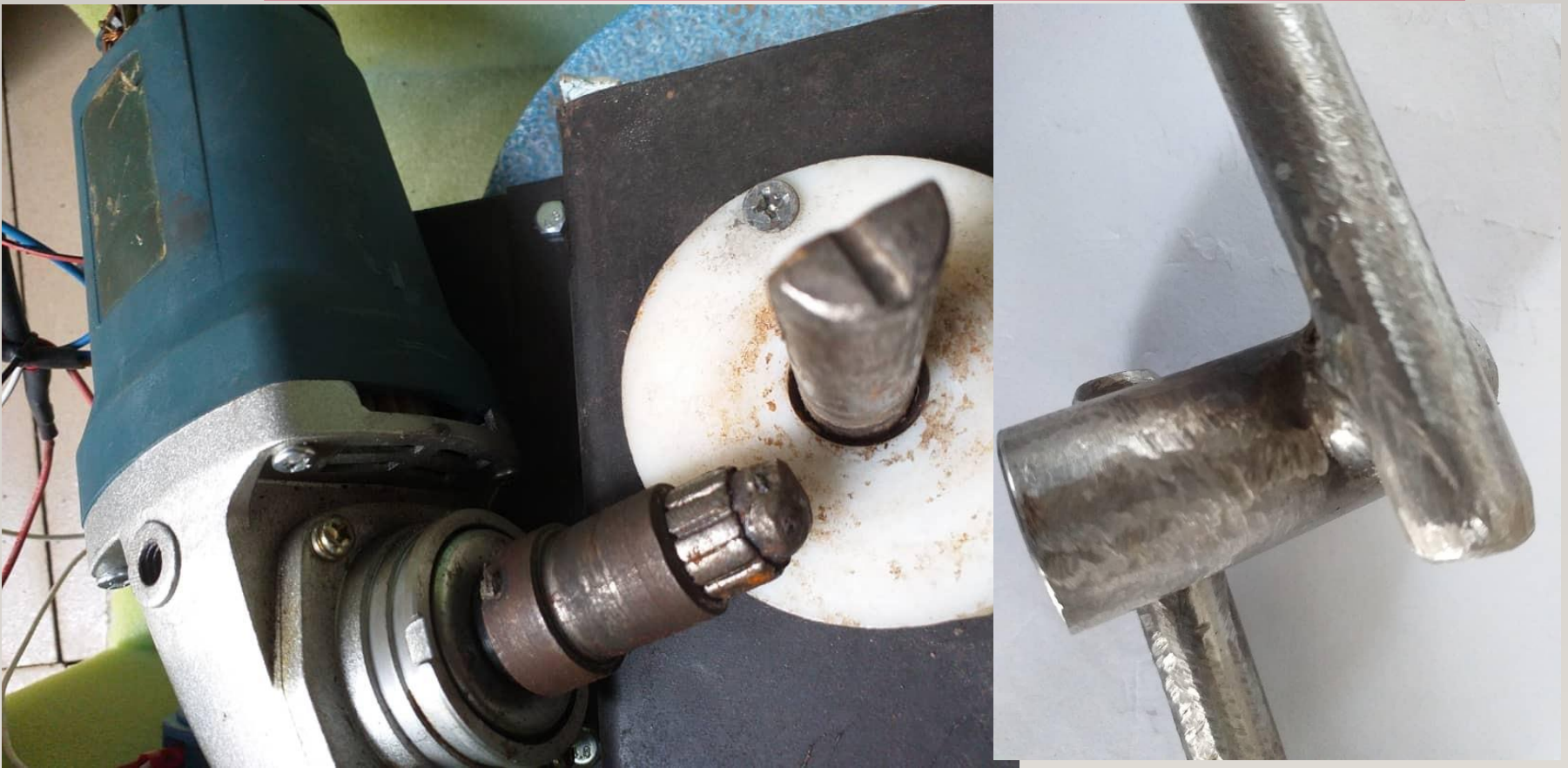
POUNDER OR FOOD PROCESSOR

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- I purchased a Made in Nigeria Yam pounder.
- It got damaged. Tried in vain to locate the manufacturers
- Opened the stuff up to find the gear teeth damaged beyond repair.
- Also noted there was no design; just an encasement for a grinding machine!

6 GRINDER, SHAFT & ROTOR



7 POUNDER OR FOOD PROCESSOR





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SHAFT, COUPLING & ROTOR

- Here you have the shaft, coupling and the rotor on the Food Processor.
- In addition, there is a superior design in the way water and food leakage to the motor is controlled;
- But it is **NOT** a Yam Pounder!

9 WHAT WE WILL DO HERE

- Ensure that **NOBODY** attending this class will be able to say the nonsense street-talk about theory that people blab all over the place that gets repeated like a broken record among lazy students and graduates who are not sufficiently primed to understand the issues.
- You will be given empowerment to make a difference: Design and make better rotors and copulings. We will provide 3-D Printing and CNC machines for designs that are convincing.
- We will test them




10 LEONADRO DA VINCI

- **Theory is the Captain, Practice the Soldiers.** You cannot win a war with one or the other.
- If you know only practical things, you are at best a fitter, an artisan or a craftsman. Tell me any product you know that was made by these people.
- It is **NOT** possible to know theory and have no practical experience. Those who say they know only theory, know **NOTHING!**



11 YOUR DUTY

In this course you have the following duties

1. Go into the markets and look at the things being sold. Analyze them and see the things that ought NOT to be imported.
 2. Set out to redesign your environment by copying, mimicking and improving based on the theories and simulations you will learn
 3. Prepare for a regional competition we will hold that will be supported by Autodesk, International Development Research Center, IDRC, Ottawa, and other sponsors yet to be named
 4. Think of your final year project as the way to properly react to Nigeria's opportunities.
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12 SOFTWARE REQUIREMENTS

- Autodesk Fusion 360. Licensing Model. Get your own copy.
 - My objective in the first three weeks is to cover your mathematical weaknesses while I discover the state of your 3D Solid Modeling ability. If you think you are really good in it, see me after the class; I may have a job for you.
- Mathematica. Costs \$100-200. Purchase a Raspberry Pi of \$30.00, Its already installed (version 10). Get it by other means.

13 BOOKS

- For Fusion 360, there are going to be videos on my website; I will direct you to videos on Autodesk website, You should learn to get online help or ask me on oafak.com
- Introduction to Continuum Mechanics by Lai, Rubin and Krempl is the book to cover your deficient mathematical preparation for this course. If you are weak in understanding multivariable calculus, you are going to have problems here. Better attend to that as I don't have time to do that for you.



14 MASC

- There is an Internationally funded research going on and this course is part of it. There is an Immersive Testing and Evaluation Software called MASC that will be available to you before the course ends. It will be on your smart phones. With it, you can test how you are doing in the Tensor Analysis and other background materials.
- This is part of a project bigger than this course. You are guinea pigs and first beneficiaries. ALL problems in the recommended text will be solved and they will be available for your practice.

15 TESTS

- I will give you Homework assignments regularly. Like the people who made the “Yam Pounder” I showed you, I know you are incorrigible copy cats. I will NOT grade the home work.
- You will have a test every three weeks. Your next test covers the first 68 pages of the recommended text.
- Lectures will be recorded. You will have access to videos prepared to make the lecture an online course that others can take if they want.

16 A NEW WEBSITE

- The **S2P Africa** – a website on our five-year multi-institutional project that is on “Rethinking the West African Engineering Ecosystem” will be available before the end of the year. For now, materials will be available for you at oafak.com.
- Today’s lecture is already posted.
- You will be requested to fill a form to measure your attitudes at the beginning of this course. You will fill another at the end for us to see what changes the course has made to your outlook.

17 HAVE A GOOD WEEK!

- Questions
- Watch out for S2PAfrica.com
- Watch out for MASC software from StudioElle