POSTGRADUATE TRAINING SEMINAR

Technology in the Classroom

A question you may be asked in (academic) interviews includes "what are your thoughts on the use of technology in the classroom?" Let us examine this statement more closely...

1. What does "technology in the classroom" mean? See, for example zero g videos (shown in MTH6132)
2. Why use technology and/or when is it appropriate?
   - Example from Mathematical Relativity course MTH6132
     - Helps to set up conceptual framework
     - Allows for longer written thoughts (carefully: don't simply *read* what you have written)
     - Gives a bigger picture of a course segment
   - Can have strong impact in Lecture and Tutorials
     - Good for motivation (or simply for the variety, e.g. 1+1 in the 2-hour lectures)
     - Worked examples of varying length and difficulty
     - Harder physical problems or applications can be showcased
     - Helpful for summaries and/or reviews
3. How can you employ it effectively: some Do's & Don'ts
   - Don't use it all the time
   - Be mindful of going too fast (or too slow)
   - It takes practice to time presentations for slide-lectures, particularly if you are accumstomed to budgeting material for boardwork
   - Make use of color, pictures/diagrams, and of course, movies!
   - Can show students how to find resources (e.g., library, arXiv, journals, etc.)

Suggested Project: we can create our own repository of examples for everybody to use in their QMUL tutorials and post them somewhere online, accessible by all instructors.

1. What could this repository look like? (e.g., websites, gifs, pdf files, slides)
2. Modules we could include for consideration in the first round
   - Calculus (tangents, areas under curves, infinite series, examples/applications from economics vs. physics)
   - Geometry (parametric curves, curvature, torsion, surfaces, geodesics)
   - Probability (uses for $\binom{n}{m}$, Balls in boxes problems, conditional probability)
   - Linear Algebra (multiplication of matrices, RREF, subspaces, Rank-Nullity Theorem)
   - Mathematical Writing (open to suggestions here)
3. Any other modules which could use improvement? (all of them, probably)

"Mathematics compares the most diverse phenomena and discovers the secret analogies that unite them"
–Joseph Fourier