------------------------------THESIS OUTLINE------------------------------

1. PREAMBLE : thesis goal, results and future
2. INTRODUCTION
   1. Ion beam therapy
      1. Physics
      2. Advantages / drawbacks
      3. Range verification
      4. Secondary radiation
      5. Prompt-gamma – physics and features
      6. State of the art of range verification
   2. Nuclear medicine
      1. PET/SPECT
      2. Comparison, advantages/drawbacks
      3. SPECT – state of the art
   3. Photons
      1. Photon interactions
      2. Photon detection
3. COMPTON CAMERAS and COLLIMATED CAMERAS
   1. Principle
   2. Applications in medicine
   3. State of the art (ion beam therapy and nuclear medicine)
4. CLARYS PROTOTYPES
   1. Hardware features
      1. Scatterer – Si
      2. Absorber – BGO
      3. Hodoscope
      4. Acquisition
      5. Electronics
      6. Mechanics
   2. Collimated camera
   3. Development status
   4. Performed tests
   5. Perspectives and next steps
5. SIMULATION WORK
   1. Ion beam therapy
      1. Design optimization and tests
      2. Tests with heterogeneous phantoms
   2. Nuclear medicine
      1. Comparison to Anger camera
      2. Design optimization for nuclear medicine
      3. Rotating system
   3. Implementation in GATE
6. CONCLUSIONS