Towards framing the problem statement which I thought of as getting better gradation of concrete I had to refresh on my understanding of mix design. I might have to read a civil book again. I trust my memory will get revived.  
  
But from chats with GPT, I asked how we know best gradation but the answer kind of makes it such that it’s based on some factors e.g, you want to achieve some certain strength of concrete, there’s no one best gradation.

Determining the best distribution of particles in concrete involves considering various factors:

1. Aggregate Properties: Understand the characteristics of available aggregates (coarse and fine). Factors like shape, size, and surface texture impact how they interact and pack together.

2. Workability Requirements: Different projects require different concrete workability. Adjust the particle distribution to achieve the desired consistency and ease of placement.

3. Strength Requirements: Consider the required concrete strength. Optimal gradation balances particle sizes to ensure the concrete can attain the necessary strength.

4. Durability Considerations: Particle distribution affects concrete durability. Properly graded concrete reduces voids, enhancing resistance to cracking and improving long-term performance.

5. Mix Design Specifications: Follow mix design specifications provided by standards like ASTM or ACI. These guidelines outline recommended gradations based on aggregate properties for specific applications.

6. Testing and Experience: Conduct sieve analysis and trial mixes to assess the performance of different particle distributions. Experience and testing help refine the mix for optimal results.

Ultimately, achieving the best particle distribution involves a balance between workability, strength, durability requirements, and adherence to industry standards, often refined through both testing and practical application experience.

Based on answer 6 I guess one could do something like for any volume of concrete, use 60% of some large agg, 20% very fine sand, 10% cement and water (I should revisit my mix design). Then another person can use say 61% very large agg, 18% small, 11% cement and water and strength can be tested.

Assessing Aims and Objectives

1. Soil Classification influences decisions on building foundations: Now building foundations are done based on region and most times I think the type of soil is not needed. Moreover, things like bearing capacity (bc) tests are also done and in cases of heavy structures or better to say low bc soils, pile tests are performed with the last layer soil type not necessarily known. Discuss more with Engineers…
2. Road construction: I think the argument for this is more robust as the top soil matters in making roads. Now I’m even thinking of bacteria percentage detection on soils. This will definitely be on a microscopic level. Because they cause some reaction I think.

**MAIN AIMS AND OBJECTIVES AND MY DISCUSSIONS ARE BELOW**

1. This is the main aim according to the students -> This research aims to analyze the effectiveness of CNN and AdaBoost classifiers in soil classification, comparing their performance with traditional methods. It seeks to provide a comprehensive understanding of how these AI techniques can be applied in the Nigerian context, potentially transforming the field of civil engineering and beyond. They seem to be saying they just want to analyse the goodness of CNN and Adaboost in soil classification compared to Lab results. I don’t think it’s strong enough an aim.
2. Further into their objectives, we have

**To Analyze Soil Properties Using AI:** One of the essential intents is to employ machine learning in analyzing critical soil properties such as moisture content, and temperature. This analysis aims to discern the suitability of various soil types for different applications. (International Journal of Innovative Technology and Exploring Engineering, 2020). I don’t think this is a problem to be faced for temperature, it’ll involve heat sensors I believe and stuff.