



**CALIFORNIA STATE SCIENCE FAIR  
2016 PROJECT SUMMARY**

<b>Name(s)</b> <b>Kirtan U. Shah</b>	<b>Project Number</b> <b>J1425</b>
<b>Project Title</b> <b>Image Compression: Which Algorithm Performs the Best?</b>	
<p style="text-align: center;"><b>Abstract</b></p> <p><b>Objectives/Goals</b> The goal of this project is to develop, test and compare multiple image compression algorithms to find out which image compression algorithms/methods are the most effective and time efficient.</p> <p><b>Methods/Materials</b> Computer, Processing IDE (Java), several test images. I developed three algorithms and tested them; one was an existing one (LZ77), the other two were original ideas (Most Common Pixel, Lines). Next, I compared efficiency and effectiveness to see which performed the best.</p> <p><b>Results</b> I found that the Lines algorithm was the fastest and most efficient, often coming up with 90% compression in less than &lt; 100ms. The Most Common Pixel algorithm took more time, usually &lt; 200ms, and could compress images up to 60%. Finally, LZ77 (an existing algorithm) performed well, with 85-95% compression, but was the slowest (~5-6sec per image).</p> <p><b>Conclusions/Discussion</b> This project showed that algorithm that looks for patterns is efficient and effective most of the time. Even though effectiveness is important, data should be easy to uncompress. For example, this is important for web applications because users need to not only send data quickly, but also uncompress it quickly.</p>	
<b>Summary Statement</b> I developed and compared multiple algorithms to find out which algorithms/methods are the most efficient and effective.	
<b>Help Received</b> I researched image compression algorithms and techniques online.	