



**CALIFORNIA STATE SCIENCE FAIR
2009 PROJECT SUMMARY**

Name(s) Shayson C. Edwards	Project Number S1404
Project Title Detecting Median Mononeuropathy and Carpal Tunnel Syndrome through Radiometric Thermal Imaging	
Abstract Objectives/Goals The objective of this study is to see if a radiometric thermography can detect Median Mononeuropathy in the articulation radiocarpalis and to establish the efficiency of thermal imagery as a viable technique for establishing the trends of Carpal Tunnel Syndrome and Median Mononeuropathy. Methods/Materials A double blind test was performed. Participants completed a medical history about general health, height, weight, diabetes, smoking, blood pressure, occupation, and acknowledged if pain in the wrist area. After 10 minutes acclimating to a controlled room temperature of 68° F ±2° a preliminary image was recorded of the predominate hand; palmar and dorsal views. The test exercise was preformed with a rotating extended arm while applying pressure with a pliable ball repeated 20 times. Radiometric thermal images were recorded of palmar and dorsal views of the predominate hand. Results Thermal imaging was used to identify Median Mononeuropathy of the predominant wrist among 69 participants. Eighteen participants with reported wrist pain 85% were identified with elevated temperature in the palmar and dorsal hand of which 70% were comprised of diabetics. These results suggest that patients with diabetic neuropathy necessitate exceptional deliberation with regard to the evaluation of suspected carpal tunnel syndrome. I also have reported in my data that smokers have a higher rate of detected elevated heat in their wrist area giving credence to the theory that smokers and diabetics have a higher incident rate of median Mononeuropathy. Conclusions/Discussion Whereas an x-ray indicates structural anomalies, thermography can point out functional anomalies. Sufficient heat was emitted in the palmar and dorsal views of the predominate hand. Swelling and or injury to the articulatio radiocarpalis region was identified and significant prevalence of carpal tunnel and Median Mononeuropathy appeared in participants with compromised (diabetics and smokers) circulatory systems contrary to popular belief of frequency in repetitive motion. The data from the test supports my hypothesis that thermal imaging can be a used to identify Median Mononeuropathy.	
Summary Statement This research proves that thermal imaging can be used effectively to identify prevalence of Median Mononeuropathy not related to repetitive motion.	
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