|  |  |  |  |
| --- | --- | --- | --- |
| Optimisation: | Speed (Seconds)  (Start from second run for better results) | Hardware Specs | Additional Notes: |
| Original Application (unoptimized) | 2. 59.536 seconds  3. 61.6576 seconds  4. 60.0882 seconds  5. 60.0617 seconds  6. 59.9781 seconds  **Average Time: 60.26432 seconds** | NVIDIA GeForce RTX 3060 Laptop GPU, memory size 6143MB, Warp Size 32, 30 Multiprocessors  AMD Ryzen 7 5800H with Radeon Graphics  **- 8 physical cores** and **16 logical threads** | UI ‘freezes’ until the sorting is completed, then the event window shows the sorted images. |
| Sorting moved to different thread to stop UI blocking (note: no other optimisation has been applied) | 2. 59.4191 seconds  3. 59.1871 seconds  4. 59.4682 seconds  5. 60.3015 seconds  6. 59.3176 seconds Average Time: **59.5381 seconds** | NVIDIA GeForce RTX 3060 Laptop GPU, memory size 6143MB, Warp Size 32, 30 Multiprocessors  AMD Ryzen 7 5800H with Radeon Graphics  **- 8 physical cores** and **16 logical threads** | UI no longer gets blocked when sorting is done; however, performance is still extremely slow. |
| Colour temperature calculation parallelised using OpenMP Thread Number = Max CPU Core Count i.e. std::thread::hardware\_concurrency() | 2. 4.35859 seconds  3. 4.44895 seconds  4. 4.37853 seconds  5. 4.39532 seconds  6. 4.25531 seconds Average Time: **4.36734** seconds | NVIDIA GeForce RTX 3060 Laptop GPU, memory size 6143MB, Warp Size 32, 30 Multiprocessors  AMD Ryzen 7 5800H with Radeon Graphics  **- 8 physical cores** and **16 logical threads** | UI responsive + sorting is completed much faster than previous version.  Images are sorted correctly. |
| Colour temperature calculation parallelised using OpenMP  +  Sorting in parallel using OpenMP (+ mutex implementation) Thread Number = Max CPU Core Count i.e. std::thread::hardware\_concurrency() | 2. 2.84117 seconds  3. 2.7232 seconds  4. 2.92751 seconds  5. 2.72788 seconds  6. 2.74503 seconds  Average Time: **2.99296 seconds** | NVIDIA GeForce RTX 3060 Laptop GPU, memory size 6143MB, Warp Size 32, 30 Multiprocessors AMD Ryzen 7 5800H with Radeon Graphics - **8 physical cores** and **16 logical threads** | Making the sorting of median values be done in parallel through OpenMP increased sorting performance. |
| Colour temperature calculation parallelised using OpenMP (+ mutex implementation) +  Sorting in parallel using OpenMP (Manually setting thread count) Thread Number = 2 | 2. 2.68964 seconds  3. 2.67879 seconds  4. 2.81731 seconds  5. 2.69047 seconds  6. 2.71277 seconds  Average Time: **2.71780 seconds** | NVIDIA GeForce RTX 3060 Laptop GPU, memory size 6143MB, Warp Size 32, 30 Multiprocessors AMD Ryzen 7 5800H with Radeon Graphics - **8 physical cores** and **16 logical threads** |  |
| Colour temperature calculation parallelised using OpenMP (+ mutex implementation) +  Sorting in parallel using OpenMP (Manually setting thread count)  Thread Number = 4 | 2. 2.6822 seconds  3. 2.741 seconds  4. 2.77412 seconds  5. 2.70654 seconds  6. 2.66228 seconds  Average Time: **2.71323 seconds**. | NVIDIA GeForce RTX 3060 Laptop GPU, memory size 6143MB, Warp Size 32, 30 Multiprocessors AMD Ryzen 7 5800H with Radeon Graphics  - **8 physical cores** and **16 logical threads** |  |
| Colour temperature calculation parallelised using OpenMP (+ mutex implementation) +  Sorting in parallel using OpenMP (Manually setting thread count)  Thread Number = 6 | 2. 2.69548 seconds  3. 2.80307 seconds  4. 2.65393 seconds 5. 2.72232 seconds  6. 2.68284 seconds  Average Time:  **2.71153 seconds** | NVIDIA GeForce RTX 3060 Laptop GPU, memory size 6143MB, Warp Size 32, 30 Multiprocessors AMD Ryzen 7 5800H with Radeon Graphics - **8 physical cores** and **16 logical threads** |  |
| Colour temperature calculation parallelised using OpenMP (+ mutex implementation)  +  Sorting in parallel using OpenMP (Manually setting thread count) Thread Number = 8 | 2. 2.69353 seconds  3. 2.61238 seconds  4. 2.71247 seconds  5. 2.63338 seconds  6. 2.64351 seconds  Average Time:  **2.65905 seconds** | NVIDIA GeForce RTX 3060 Laptop GPU, memory size 6143MB, Warp Size 32, 30 Multiprocessors AMD Ryzen 7 5800H with Radeon Graphics  - **8 physical cores** and **16 logical threads** |  |
| Colour temperature calculation parallelised using OpenMP (+ mutex implementation)  +  Sorting in parallel using OpenMP (Manually setting thread count) Thread Number = 10 | 2. 2.70525 seconds  3. 2.68257 seconds  4. 2.68734 seconds  5. 2.64077 seconds  6. 2.67829 seconds  Average Time:  **2.67884 seconds** | NVIDIA GeForce RTX 3060 Laptop GPU, memory size 6143MB, Warp Size 32, 30 Multiprocessors AMD Ryzen 7 5800H with Radeon Graphics  - **8 physical cores** and **16 logical threads** |  |
| Colour temperature calculation parallelised using OpenMP (+ mutex implementation)  +  Sorting in parallel using OpenMP (Manually setting thread count) Thread Number = 12 | 2. 2.69056 seconds  3. 2.68001 seconds  4. 2.67671 seconds  5. 2.6782 seconds  6. 2.66889 seconds  Average Time:  **2.67887 seconds** | NVIDIA GeForce RTX 3060 Laptop GPU, memory size 6143MB, Warp Size 32, 30 Multiprocessors AMD Ryzen 7 5800H with Radeon Graphics  - **8 physical cores** and **16 logical threads** |  |
| Colour temperature calculation parallelised using OpenMP (+ mutex implementation)  +  Sorting in parallel using OpenMP (Manually setting thread count) Thread Number = 14 | 2. 2.65913 seconds  3. 2.62094 seconds  4. 2.64216 seconds  5. 2.7275 seconds  6. 2.77942 seconds  Average Time:  **2.68583 seconds** | NVIDIA GeForce RTX 3060 Laptop GPU, memory size 6143MB, Warp Size 32, 30 Multiprocessors AMD Ryzen 7 5800H with Radeon Graphics - **8 physical cores** and **16 logical threads** |  |
| Colour temperature calculation parallelised using OpenMP (+ mutex implementation)  +  Sorting in parallel using OpenMP (Manually setting thread count) Thread Number = 16 | 2. 2.70337 seconds  3. 2.631 seconds  4. 2.71376 seconds  5. 2.75601 seconds  6. 2.69423 seconds  Average Time:  **2.69967 seconds** | NVIDIA GeForce RTX 3060 Laptop GPU, memory size 6143MB, Warp Size 32, 30 Multiprocessors AMD Ryzen 7 5800H with Radeon Graphics  - **8 physical cores** and **16 logical threads** |  |