Productivity is the watchword for any organization because “Drops of Productivity add to ocean of profits”. Assembly Line Balancing (ALB) is very important for improving the productivity of mass production systems.

Assembly Line Balancing is concerned with assigning number of work elements to various workstations so as to maximize Balancing Efficiency or to minimize number of workstations or to accomplish any other objective for a given volume of output without violating the precedence relationship.

In this research, a new heuristic “New Efficient Heuristic (NEHU)” has been developed for solving Deterministic Assembly Line Balancing problem, which will be useful for designing mass production system in an effective manner.

This proposed heuristic comprises the following:


ii) Composite Weight Factor (CWF) heuristic – Newly proposed.

iii) New Global Search Heuristic (NGSH) – Newly proposed.

In this proposed heuristic, the best of the results of HAL and CWF heuristic is selected as the Best Initial Seed. Then it is improved using NGSH. The performance of the proposed heuristic is compared with that of the existing set of heuristics, Heuristics for Assembly Line – Balancing (HAL).

Also, the power of this proposed heuristic has been proved by an extensive experimental design namely, ANOVA. Software in Visual Basic is developed for testing the sample problems generated in this work.

Apart from this, a case study demonstrating the application of the proposed heuristic to a factory manufacturing Turbo – chargers is also presented.
The following are the major contributions of this research work:

1. Most of the Global Search Methods (GSM) used for obtaining near optimal solutions for ALB problems stop when stopping criterion is reached which is not a desirable property. This is avoided by this new heuristic.
2. Global Search Methods start with an inferior initial solution. But this proposed heuristic starts with the Best Initial Seed to reach better optimal solution.
3. No suitable heuristic is available which gives different weightage to different priority rules used in line balancing. Since all the priority rules may not have equal impact on the solution, they have to be prioritized by giving suitable weights to them. This lacuna is removed in this proposed heuristic to get better initial solution.
4. This heuristic is applied to a case problem “Turbo-charger assembly” and the solution has been recommended for implementation.