

# **NEWTECH SOFTWARE PRIVATE LIMITED**

## **Projects / Products Completed**

### **General**

Newtech Software (P) Ltd; has a very strong background in Embedded software development. Design by simulation is the concept that is being employed by Newtech software that helps in speeding up the development and proving the concept before delivery. Sectors such as Telecom, Airlines, Aircraft, Consumer electronics and Automotive sectors have products whose competitive features depend on the software that have embedded to them.

Newtech software concentrates on Market Specific Processors (MSP) by developing application specific software around popular general-purpose CPU cores.

Also Newtech Software has competence in developing and configuring Scalable Real Time Kernel for embedded systems, and device drivers for DOS/WINDOWS & UNIX/Linux environment, and implementing network protocols including industrial field bus protocols. Newtech software has a very good technical expertise in the area of GUI development. And has developed GUIs for a range of sectors- enterprise environment, network management, portable handheld devices and system simulation environment

Newtech software concentrates on automotive sector, telecom sector, wireless & Internet Appliances. Newtech software has expertise developing and validating software for safety-critical systems-having experience in

- Verifying Safety
- Validating Compilers
- Integration Testing
- Configuration Management

for flight vehicles. Newtech software has experience in developing telecom protocols and Internet connectivity to devices. With this background, it is planned to develop generalize protocol stacks for wireless devices and develop software for converging residential services to Internet.

Newtech software offers clients innovative approaches to enhance and optimize the major business processes by IT, enabling them leaving the client to concentrate on their core activities by way of offshore development and/or on-site development.

Newtech software concentrates on intelligent data mining that improves decision support systems and also concentrates on advanced AI technology to improve automatic e-marketing personalized customer care, document/e-mail management general content management and risk management.

Newtech software has expertise in (intelligent) software agents and is being applied in generalized network management-

- Developing applications that will identify the most profitable routes.
- Billing and customer relation (personalization) that will help the carriers in identifying the most profitable customer and suggesting ways and means to use IT to serve them better.
- Develop applications for creating remote intelligent network management for the carriers.

In the area of Enterprise management, Newtechsoftware has developed a software tool for complete statistical analysis that will help managers and management to take appropriate decision at various points of the organization.

Further Newtechsoftware specializes in software quality assurance methods for safety critical real time systems and commercial software such as verification/validation, test case generation and testing, reliability studies, and safety analysis. Newtechsoftware organizes technical courses on software project management, software quality assurance and embedded systems for international participants.

### **EMBEDDED SOFTWARE:**

Newtech Software has a very strong background in software development for embedded systems. The important software projects developed include

#### **On-board GPS Software:**

This is a complete route, navigation, and mapping software with all the necessary GUI for a hand-held air-bone GPS.

Click on links for Install Demo Version and User Manual

[GPS Demo Version](#)

[GPS User Manual](#)

### **ALE Controller Software:**

Software for automatic link establishment between H.F. modems has been developed. This will be extended to multiple stations and also higher layers for communications through fax, e-mail, and voice.

### **Pager Software:**

Full range of pager software has been developed.  
This consists of two parts.

Programming individual pagers with prefixed parameters such as identification etc.

Complete GUI based message composing and transmission base station software.

Click on links for Presentation

### **Channel equalization using AI:**

A detailed design study has been made on 'Automatic communication channel equalization using Neural Network and discriminative learning' and a technical proposal has been submitted for approval by the vendor. This software will be completely portable to some of the signal processors available in the market.

### **ATM traffic management using AI:**

AI is used in managing the network to improve the QOS. A detailed design study has been made and submitted a technical proposal has been submitted for approval from the vendor. This software will be developed for network with ATM switches.

### **Software Agents:**

Embedded agent software for terminal guidance of flight vehicles which has improved the guidance accuracy very much.

Real-time simulation

Real-time simulation of the flight vehicle for its entire flight path has been developed.

### **Multi-station ALE Controller:**

We have developed full ALE protocol for multiple HF modem stations.

## **ALGORITHM DEVELOPMENT**

As part of Mobile Computing technology, Newtech has developed innovative algorithms in related areas.

**Soft GPS:** The following algorithms have been developed, tested, validated, and implemented in the project on 'Soft GPS Receiver' development.

- Averaging Correlator to improve the sensitivity of the receiver

- Faster acquisition and tracking algorithm with minimal loss of lock

- Adaptive 'Multipath' elimination algorithm

**Routing and navigation:** The following algorithms have been developed, tested, validated, and implemented for Air-borne GPS applications Complete routing and mapping algorithm

- Time-to-go

  - Fuel left

  - Course deviation

  - Position on the greater circle

**Flight vehicles:** The following algorithms have been designed, developed, validated, and implemented to improve the accuracy in the terminal guidance of flight vehicles.

- Novelty algorithm to detect events

- Clustering algorithm for time series data

- Intelligent agent software

**Software quality:** The following algorithms have been designed, tested, validated, and implemented in 'Heuristics' – A software quality analysis tool

- Quality model

- Call graph,

- control graph,

- Kiviat graph,

- Criteria graph

- Textual and structural complexity metrics

**Filtering algorithm for time varying non-gaussian signal:** Algorithms are developed for time varying non-gaussian signals of a seeker used in flight vehicles

## **APPLICATION OF AI IN DATA MINING**

Newtech has applied data mining with AI in many applications. One or more of the following data mining algorithms have been employed in the following applications.

- Clustering

- Event detection

- Profiling

**Flight vehicle application:** In AI enabled Data mining application for flight vehicles, Newtech has developed the following algorithms to improve the terminal guidance accuracy

- Novelty algorithm to detect events

- Clustering algorithm for time series data

- Intelligent agent software

**Crime detection:** Currently, Newtech is working on application of data mining with AI in Law enforcement. As part of 'Mobile computing application in government public safety department', Newtech is applying the following algorithm for detecting criminal activity

- Clustering

- Profiling

**Decision support-Electrical utility:** Newtech is working on data mining application in public utility services such as 'Electrical power generation and distribution' to produce a 'Decision Support System' based on past data.

**Fraud detection:** Newtech is also working on applying data mining techniques with AI in the following areas mainly using clustering, event detection, and profiling.

- Fraud detection and management in telecommunication application

- Fraud detection and management in banking application

## **VISUALIZATION**

Newtech has developed many applications in 2D and 3D framework

Flight vehicle terminal guidance scenario has been visualized using 3D graphics

Air-borne GPS has many 2D graphics to depict the routing, cross deviation, relative position, etc;

HEURISTICS and SAVID – Both the tools developed by Newtech have full range of 2D visuals

## **Universal embedded GUI:**

A generalized GUI having a capability of generating any type of graphical symbols from primitives have been developed. This will be particularly useful for automotive applications, all hand held mobile devices and industrial man machine interfaces. In these applications, our software module will allow easy modification, up-gradation and simulation very easily and quickly. This is basic requirement where designers follow the concept of 'Design by Simulation'.

## **GUI for GPS:**

The GPS software is a highly graphical user interface related one. The data entry is through very simple 5 key buttons that demand a very good user interface on the small screen of the hand held GPS. The mapping and routing functions utilize a really geometrical graphics oriented interface for user.

### **GUI for flight path construction:**

GUI for the flight path construction of a flight vehicle is done with 3D graphics format with a typical scenic background. Any portion of the flight could be zoomed for further clarity. Heavy emphasis is given for the terminal phase of the flight. All the parameters required for the simulation are taken in through textual interface.

### **GUI for Code Analyzer:**

The product code analyzer developed by our company employs graphics to depict the structure of the program and also provide a graphical representation of the software quality.

### **GUI for Data Analysis:**

The product 'SAVID' a data analyzer developed by our company again use a plenty of GUI for displaying the end result of data analysis to the user, in the form of 'Bar chart', 'Pie chart', 'Trend analysis' etc.

### **INTERNET APPLICATIONS:**

#### **E-Catalogue Management**

Newtech is developing an automated E-Catalogue management system using AI/Learning techniques which gives faster processing time and accuracy.

### **SYSTEM INTEGRATION:**

Our company has done work in the area of system integration of critical real-time embedded software. The area of work include

#### **Safety Analysis:**

Our company successfully carried out the safety verification of safety-critical flight control software. Also similar safety analysis was completed for a digital engine control system also. Configuration management and Integration testing Our team of engineers gave the main technical support for configuration management and integration support for the safety-critical flight control software. Ada compiler validation - Technical support Our team of engineers gave full technical support for "Ada compiler validation' for use in the safety critical flight control system.