The nation’s first commercially-available virtual 5-axis machining simulator. The V-Machine (Virtual Machine-tool) supports a variety of industrial machine tools (10 kinds) and controllers (10 kinds) that enable direct mechanical manipulation and verification of the NC program in the virtual environment. Virtual machining and collision detection, tool-path display, linkage with the actual CNC program by COM+ (iTNC-530 programming station), HMI application using a vector graphics format with Active-X shockwaveflash control, and many software design patterns applied internally.

2. 3D virtual CNC training program (2005 - 2011)

V-CNC (Virtual Computer Numerical Control) is educational software for learning the NC program that has sold more than 8,000 copies nationwide. This enables virtual environment simulation and includes a number of learning aids, video tutorials, machine collision detection, and motion generation of CNC.

Robot simulation of the real robots on iRoDi®. I programmed simple inverse/forward kinematics algorithm for SCARA and wafer robot and serial communication module. Basically iRoDi® has 3D virtual robot environment platform. My team added some extension modules and 3D CAD model for industrial robot and mobile robot. Added robots were articulated robot(Kawasaki FA10N), SCARA robot(DMBH SR-1000, SSR-750), wafer robot(DMBH SWR-950), cartesian robot and mobile robot(KMC KR2008, NT research DR20).


V-MECA (Virtual-Mechatronics), implemented as a PC-based 3D simulation technology, GK-DEVS (Geometry and Kinematics Discrete Event System), is a FA(Factory Automation) comprehensive simulator for automated training. Create FA equipments with Library 3D CAD data bundled with a variety of FA components such as hydraulic cylinders, conveyor, scara robot and many kinds of sensors to which additional automation elements may be added by the user for PLC(Programming Logic Controller), MICOM, and electric sequence format control. Simulation performed by PLC-controlled equipment. Features real PLC H/W control and H/W monitoring using RS-232C and OPC C/S communication.

Virtual simulation software with electrical circuits and equipment. Supports electrical circuit design / verification and practice in placing/wiring real electric components. I added electrical elements such as relay, lamp, timer and etc for electronic sequence control control. I implemented to enable circuit wiring and circuit analysis of electrical elements.


Monitoring and control program of MIG welding machine. This is for generating the control signal and monitoring the MIG welding controller with AD, DA and DIO adam I/O module of Advantech co., Ltd from RS-232C serial communication.

6. CNC examination program (2004 - 2005)

A CNC program for qualification tests, the program automatically provides correct answers, grades, sorts, and provides statistics for each question after test has been completed. Window Socket TCP/IP communication detects cheating with a variety of PC checks and input history log, etc. Results are scored and individual excel files created to store and generate statistics.

Multi-joint robot design, collision detection, off-line programming, operation and utilization of robot using teach pendant and a variety of educational functions and contents. I participated to implement an interpreter (RIS-Robot Interpreter Shell) and apply specifications subject to RRS. And I took part in 3D simulation work in conjunction with RCS by Hyundai Heavy Industries Co. Implementation of 3D modeler work and interpreter is able to be simulated mechanical motion with tool-path of an end effector.

8. 3D tool-path viewer with Open-GL (2000)

A three-dimensional tool path viewer developed using MFC and OpenGL Graphics Library. Represents tabulated results of 3-axis NURBS surface interpolator algorithms used in Masters thesis and continuous tool paths using three-dimensional graphics.