

Massachusetts Institute of Technology
Department of Electrical Engineering and Computer Science
6.111 - Introductory Digital Systems Laboratory

Project Suggestions

In past years, a great variety of projects have been successfully completed. The following is a list of some of these completed final project reports.

The project reports for the years 2003 and earlier are on file in 38-684. Some may be missing, likely they were not returned by a former student. We have no other stash of old project reports. You may sign out any one for an overnight loan or for reading in the lab. You are free to make a copy of part or all of a report if you want to keep it for a longer time. From 2004 on, all reports are on the respective web pages. The best and most interesting of your project reports will be used to augment this list for future terms.

It is often more satisfying to have projects which do something in addition to blinking LEDs. Examples are audio output, TV monitors, or VDT terminal displays.

Be careful – most unsuccessful projects were too complex. We will help you to size your project appropriately.

- Computer/Editor/Graphics

- 94-8 Video Editing in Real Time
- 94-11 OSCAR, Optical Character Recognition Machine
- 94-16 Digital Oscilloscope
- 96-3 Visually Controlled Pointer Device
- 96-7 An Object Tracker
- 96-15 A Personal Location and Navigation System at MIT
- 97-4 Stretch
- 97-9 Digital Postscript Imager
- 2000-2 The Design and Implementation of a Digital Oscilloscope
- 2000-4 Brushfire: A Hardware Platform for Running a Modern Operating System
- 2000-8 Design and Implementation of a General Purpose Computer based on the 6.004 Beta Architecture
- 2001-15 JPEG Decompression
- 2002-6 Design and Implementation of a Mandelbrot Set Generator
- 2003-3 Hardware RSA Encryption
- 2003-7 Infrared Instant Messenger
- 2003-10 360 Degree LED Display

- Games

- 90-1 Video Jigsaw
- 90-5 MEMRUC – The Game

90-7 Digital Othello
 90-8 Connect Four Machine
 90-10 Master Mind – A Video Game
 92-9 Nerd Kit Asteroids
 93-16 Tetris
 94-18 The 6.111 Pinball Machine
 95-1 Virtual Kaboom
 95-6 B-n-B Space Invaders
 96-4 Battleship
 96-6 The Pinball Project
 97-1 The Amazing Maze
 97-7 Ninja Master Fighting Game
 98-1 Core Wars
 98-9 Main Battle Tank
 98-12 Sign Language Hangman
 98-16 Automated Foosball
 99-9 Electronic Talking Battleship
 99-11 Pac-Man
 99-14 Wireless Marksmanship Trainer
 99-17 Air Connect Four
 99-21 3-D Maze Navigation
 2000-5 Stoplight Pitch Nintendo Shifting Controller Entertainment System
 2001-3 CTF.111 (Capture the Flag)
 2001-5 Super Mario Brothers
 2001-8 Monkey Box: an 8-bit Video Game platform
 2002-5 Nibbles
 2002-9 Mastermind against the Machine
 2002-11 Pokemon Punchout
 2003-8 Virtual Dodgeball
 2003-9 Duck Hunt
 2003-12 Alleyway
 2004-2 iGameplay
 2004-9 Nintendo

- Music/Audio

90-3 A Digital Music Synthesize
 90-4 A MIDI Controlled Digital Music Synthesizer [MIDI]
 90-12 The Magic Music Machine
 90-14 Γ: The Musical Project
 91-1 Air Piano
 91-7 Optical Music Recognition
 93-4 Programmable Multi-Channel Sound Synthesizer
 94-5 The Digital DJ
 94-9 The Multi-Mode Windowing Subtitling Machine
 94-10 Super Sampling Sound Sequencer
 94-13 The Digital Graphic Equalizer
 95-4 Self-calibrating Audio Equalizer

95-14 Bach's Napkin
 96-11 BPM 2001: A Digital Odyssey
 97-2 The Virtual Conductor
 98-17 Humanoid Robot Ear Sound Localization
 99-22 Digital Air Band
 2001-7 Programmable Symphony
 2001-9 The Digital DJ
 2001-14 Rhythm Master
 2002-1 Music Capturing, Editing, and Playback Unit
 2002-10 A Digital Turntable and Effects Processor
 2003-6 Wireless MP3 Jukebox Computer
 2003-11 RIVO - Live Radio Recorder
 2003-14 Funky Drum Machine
 2003-15 Bassbuddy
 2004-1 Midi-Controlled Sample Based Synthesizer
 2004-8 Voice Verification

- Video
 - 90-9 Video House of Mirrors
 - 90-16 Video Jigsaw
 - 91-5 The MCG-30 Raster Image Processor
 - 91-6 Smart Vision
 - 92-1 The \$6000 Answer to AT&T's \$1500 Videophone
 - 92-5 Video Tracker
 - 92-8 Digital Darkroom
 - 93-9 Digital Video Mixing Board
 - 93-10 Air Sketcher
 - 93-11 Killer Crayons!
 - 93-15 Recursive Picture Manipulation
 - 94-2 Digital Poisson Engine
 - 94-12 Video Chromakeying
 - 95-11 Picture in Picture
 - 95-12 Intelligent Picture-in-Picture Video
 - 96-1 Design and Implementation of a PONG Game
 - 96-5 The Digital Conductor
 - 98-3 Downtown Traffic Control Simulator
 - 98-4 3-D Vector Graphics Engine
 - 98-5 The Speed Detector
 - 98-10 Design and Implementation of a Target Finding and Termination system
 - 98-14 GEORDI: Generalized Enhancement of Real-time Digital Imagery
 - 98-18 S.I.M.A.E.D. Still Image Magnification and Enhancement Device
 - 99-10 RC4 Video Encryption
 - 99-13 Touchscreen Phone
 - 99-20 A Closed-Caption Decoder
 - 2001-6 Mr. Etch-a-Sketch
 - 2001-2 A Digital Video Security System
 - 2001-10 Visual Target Tracking System

2002-7 Magnetic GamePen
2004-6 3D Real Time Renderer
2004-7 WackaTim

- Speech and Communications

93-3 Telephone Switching System with Voicemail
93-17 Speech Synthesis Using Linear Predictive Coding
93-18 A Single Phone Line Demultiplexor
95-2 Time Multiplexed Single Line Communication System
98-2 A Flexible Dual Tone Multi Frequency Filter
98-11 A Voice Based Data Acquisition System
98-21 Home Security System with Telephone Interface
2001-4 Magnetic Card Reader
2002-8 Text Translator

- Robotics

90-2 2-D Robot Arm Solving the Shuttle Puzzle Mechanically
92-6 Robothello
94-6 Seeing, Object-collecting Robot
96-13 The Digital Duck Terminator
98-20 To Mars and Beyond
2000-1 Theseus
2000-6 Writing Robot
2000-7 OJ Rover
2001-11 Writing Robot
2002-2 The “A-Mazing” Robot *Starring Hank the Tank

- Miscellaneous

87-12 The Life Machine
90-13 Super Paint
92-2 ASPIRE Audio Signal Processor Ideally Realm Exclusive
92-3 Digital Patchbay
93-2 MAP (Map Algorithm Processing)
93-6 6.111 Lab 3 Sights and Sounds Unlimited: A Laser Light Show
94-4 The Conniption Machine
94-15 Dream Machine
94-17 Elevator Control System
93-7 Laser Diagnosis System
95-3 Attitude Control System for a Small Satellite
95-5 Infrared Security System
95-8 Chaotic Scrambler/Descrambler
96-9 Internet Message Board
98-13 Sonar with Pulse Compression
99-15 Digital Pet Parrot
99-16 Digital Billboard
2001-12 Power Wheels: An Autonomous Driving Machine
2002-3 Automatic Autobahn

2002-4 Digital Bookmark
2003-1 Digital Fan Control System
2003-2 Dialup Remote Weather System
2003-4 Affordable Eyecare: A Low Cost Autorefractor
2003-5 Wireless Electrocardiogram
2003-13 Electronic Target Shooting
2003-17 Crashpad
2003-16 Sound Source Tracking
2004-3 Dance Dance Revolution
2004-4 FROGGER
2004-5 A Wireless Rover with External Video Feedback