

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.

All the project reports listed below are on file in 38-684. 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. 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 Navitgation  
 2000-5 Stoplight Pitch Nintendo Shifting Controller Entertainmenet 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

- 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

- 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

- 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