Project PAM

The world's first open source hardware DLP 3D printer.

Carbondale, Illinois, United States Technology

Welcome to Project PAM.

We are a team of undergraduate engineering students working on a Senior Design Project at Southern Illinois University Carbondale. We have great passion for advancing the open source and 3D printing community. Project PAM is hosted on GitHub at projectpam.github.io.

PAM stands for Photoresin Additive Manufacturing. This type of 3D printing gets away from the extruding spaghetti machines we're all familiar with and instead uses light-curing resins to build your models. This means higher resolution, fewer moving parts, and faster build times. The only jam to worry about is the kind you eat with peanut butter.

The goal for this project is to produce a high resolution DLP printer which is fully open sourced using available or easy to fabricate hardware in a flexible, well documented design. Project PAM takes DLP 3D printing in a new direction,

$741 USD
RAISED OF $2,500 GOAL

30% 0 time left

This campaign started on Sep 30 and closed on October 28, 2014 (11:59pm PT).

Flexible Funding

CAMPAIGN CLOSED
This campaign ended on October 28, 2014

SELECT A PERK

$5 USD

Thank You

For contributing $5.00 or more you will receive a personalized thank you email from the team and you will be immortalized as a funder on our website.

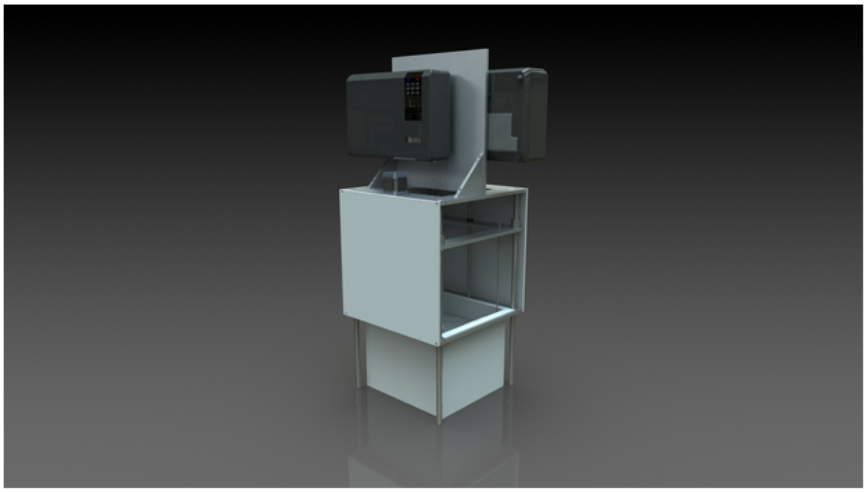
0 claimed

$25 USD

Key Chains

For a contribution of $25.00 or more you will receive one Open Source Hardware Association logo key chain AND one Open Source Initiative logo key chain. Our intent is to 3D print these key chains with the Project PAM prototype.

providing the largest build area of any hobbyist DLP 3D printer on the market without sacrificing resolution.



Crowdsourcing

Project PAM is a Senior Design Project that has been funded in part by the SIU Engineering Departments. However, they are not capable of providing any additional funds to allow us to complete a working prototype. With the Departments help and support we are asking the community to help us successfully build and fully test a reference design. This prototype will showcase a hardware configuration which proves our design and provides the community with a complete and fully capable DLP 3D printing solution. Any left over funds will go towards creating a student makerspace within the SIU College of Engineering.

We would like to express our appreciation to our donors through the time honored crowdfunding tradition of perks. Our tiers include 3D printed keychains, bound prints of documentation and plans (on paper), up to a full unassembled hardware kit. The unassemmbled hardware kit will include the chassis, all linear motion parts, a resin vat, all electronics, and an enclosure. Basically all parts excluding projector(s). Our eventual goal for the project is for this hardware to be less than $1000 for consumers to assemble. Our perk point for this kit is $1500 to include money for prototyping, testing, and iterating our hardware design. This is the intention of this campaign, after all!

Why Open Source?

Our first priority when starting out was to keep everything open-source; this includes both hardware and software. To ensure this, we have followed the Open Source Hardware (OSHW) Definition set by the Open Source Hardware Association (OSHA).

Open Source Hardware (OSHW) Statement of Principles 1.0:

Open source hardware is hardware whose design is made publicly available so that anyone can study, modify, distribute, make, and sell the design or hardware based on that design. The hardware's source, the design from which it is made, is available in the preferred format for making modifications to it. Ideally, open source hardware uses readily-available components and materials, standard processes, open infrastructure, unrestricted content, and open-source design tools to maximize the ability of individuals to make and use hardware. Open source hardware gives people the freedom to control their technology while sharing knowledge and encouraging commerce through the open exchange of designs.

(Additional cost of $10 for international shipping.)

Estimated delivery: **January 2015**

7 claimed

$250 USD

Bound Documentation of Design

For a contribution of $250.00 or more you will receive all documentation associated with the design professionally bound and well presented. Also includes $25 perk. (Additional cost of $50 for international shipping.)

Estimated delivery: **January 2015**

1 claimed

$1,500 USD

Full Kit and Documentation

For a contribution of $1,500.00 or more you will receive a full unassembled build kit for the printer. (The kit does not include projectors.) Also includes $25 perk and $250 perk. (Additional cost of $300 for international shipping.)

Estimated delivery: **January 2015**

0 claimed

Do you think this campaign contains prohibited content? Let us know.

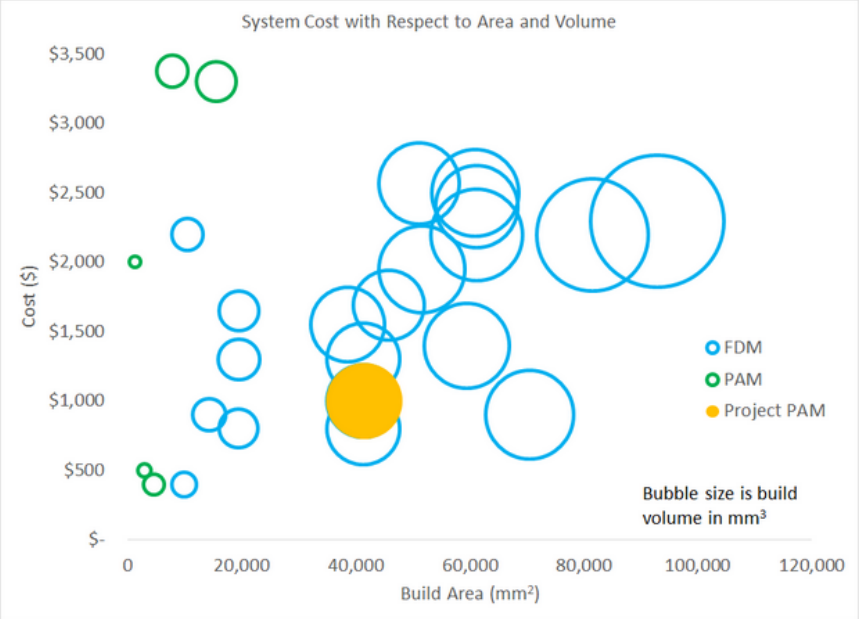
The licenses Project PAM use are:

- Hardware: CERN OHL v1.2
- Software: GNU GPL 3.0
- Documentation: CC BY-SA 4.0

Many DLP 3D printers claim to be open source, yet have patents associated to the design, non-commercial licensing, or do not properly host and share their designs.

Tired of Those Stupid Spaghetti Machines?

Photoresin additive manufacturing printers have many advantages over fused deposition manufacturing (FDM) printers. There are fewer moving parts, faster build times, and no jams. Currently there are DLP 3D printers on the market; however, most have either high cost or small build volumes. Our design is low cost ($1000) and also features a build volume comparable to leading FDM printers.



How is our design more flexible?

Project PAM has a max build volume of just under 9 liters. We are able to accomplish this by supporting dual 1080p projectors; however, the system is designed to be compatible with projectors of any resolution and also a single projector.

Maximum build dimensions:

- X: 21.6 cm
- Y: 19.8 cm
- Z: 21.6 cm
- Volume: 9 L

We have designed Project PAM to use mostly off-the-shelf parts that can be bought through Adafruit, Amazon, and industrial supply warehouses. An advantage to using off-the-shelf parts is that the design can be easily modified to suit any needs. One aspect that can be easily modified is the size of the build table and resin vat.

We have also used the off-the-self mentality when it comes to the resins we use through the use of Maker Juice G+ resin.

Our hardware design should be compatible with some currently available software

and firmware. For our reference design we will be forking software from B9 Creations. This fork will be compatible with as compatible as possible with available projectors and resins. We will be using Grbl firmware for motion control in our reference design. If funds allow, we intend on incorporating H-bridge hardware compatibility into our Grbl implementation. This would allow our reference design to be compatible with many more motor controllers.

Featured On

3DPrint.com: Project PAM – College Students Look to Create an Entirely Open Source DLP 3D Printer

3DPrintingIndustry.com: Help The Open Sourced DLP 3D Printer called Project Pam on Indiegogo?

WSIU: SIU Engineering Students Use Crowdfunding for 3D Printer

Contact Us

For general correspondence please email us at projectpam.siu@gmail.com

Questions and comments can be posted on our mailing list or you can email them to projectpam@googlegroups.com.

Follow us on GitHub, Twitter, Facebook, Google+, and YouTube.

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VERIFIED

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Campaign Support

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