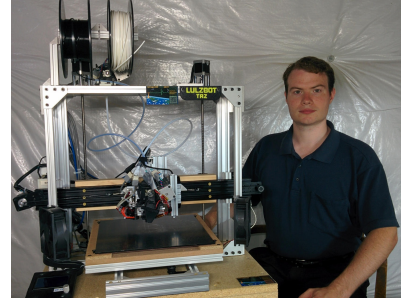Resume, recruiting, policy, demos, etc, regarding 'author' mirage335.

Reading

Recommended reading includes...
* document-biography.pdf
* document-recruiting-complete.pdf
* document-numbering.pdf
* zzLib_895-reference/from_uTST (image gallery)
* zzLib_895-reference/demo (image gallery)
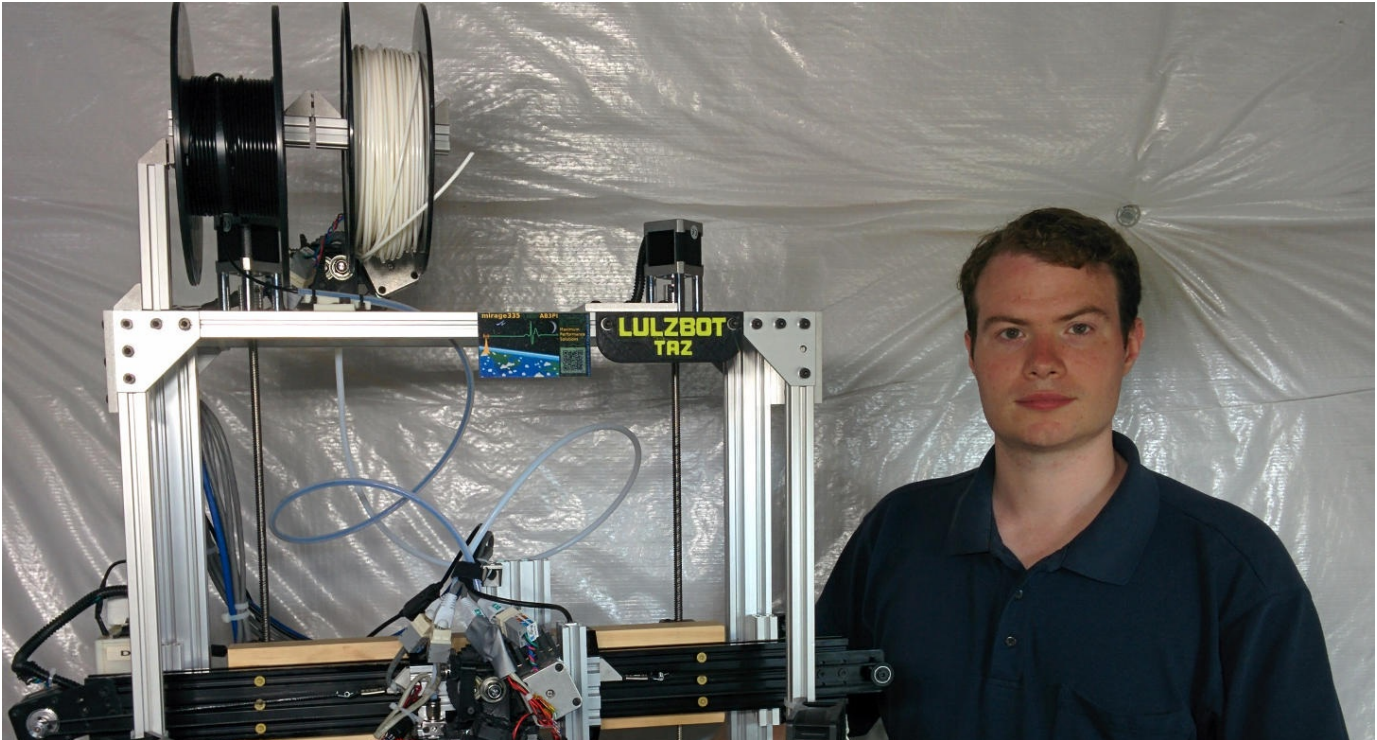* zzLib_895-reference/demo/_misc (image gallery)

mirage335 autobiography

My strong interest is in deploying a self-expanding VR environment throughout uninhabited galaxies and most of the Milky Way, so we can all get the most out of life. Already on the frontier of working and living in VR, with >2k hours in headsets and among the first people in the world to get a prototype Pimax Vision 8kX headset. Have designed much hardware and software emphasizing complete 'out-of-the-box' FLOSS toolchains, and more is always underway. Also have a long track record of non-profit volunteer service, particularly with HacDC, The Capital Hackerspace.
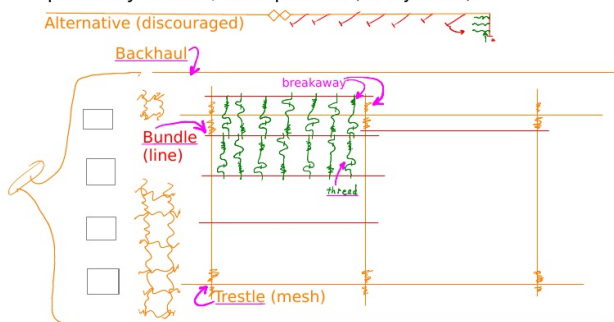
Name is Matthew "mirage335" Hines, also findable as "m335" (Discord servers, etc) and "AB3PI" (Amateur Radio).
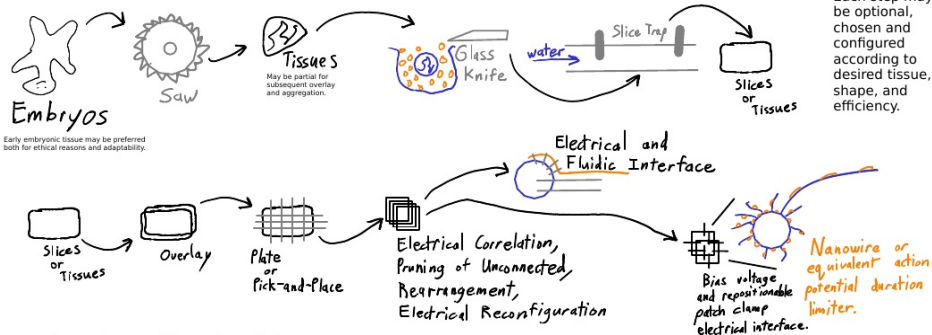
http://mirage335.member.hacdc.org

Thin threads are punched at breakway
points by needle, then pushed (or injected).

Alternative (discouraged)

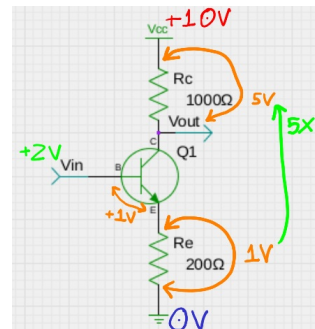Backhaul

breakaway

Bundle
(line)

thread

Trestle (mesh)

One piece only. Single sliced polyamide
(or similar material) substrate for CMOS fab.

Automated, Fast - Extraction, Slicing, Dicing (of brain tissue)

Embryos

Early embryonic tissue may be preferred both for ethical reasons and adaptability.

Saw

Tissues

May be partial for subsequent overlay and aggregation.

Glass Knife

water

Slice Trap

Slices or Tissues

Each step may be optional, chosen and configured according to desired tissue, shape, and efficiency.

Slices or Tissues

Overlay

Plate or Pick-and-Place

Electrical and Fluidic Interface

Electrical Correlation, Pruning of Unconnected, Rearrangement, Electrical Reconfiguration

Bias voltage and repositionable patch clamp electrical interface.

Nanowire or equivalent action potential duration limiter.

+10V
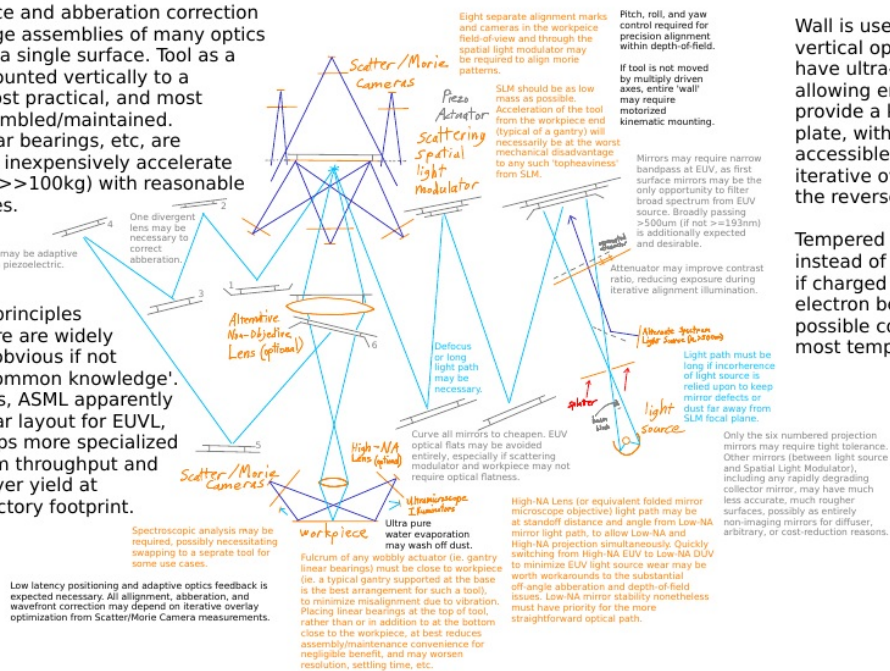Vcc
Rc
1000Ω
Vout
5V
5X
+2V Vin
Q1
+1V
Re
200Ω
1V
0V

flatTool

Accelerating Wall of Large Heavy Optics

Mirror bounce and abberation correction imposes large assemblies of many optics mounted to a single surface. Tool as a flat table mounted vertically to a gantry is most practical, and most quickly assembled/maintained. Modern linear bearings, etc, are adequate to inexpensively accelerate such loads (>>100kg) with reasonable settling times.
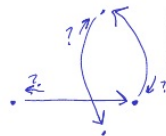
All working principles depicted here are widely known and obvious if not definitely 'common knowledge'. Nevertheless, ASML apparently uses a similar layout for EUVL, albeit perhaps more specialized for maximum throughput and complete layer yield at minimum factory footprint.

Eight separate alignment marks and cameras in the workpeice field-of-view and through the spatial light modulator may be required to align morie patterns.

Scatter/Morie Cameras

Piezo Actuator

scattering spatial light modulator

SLM should be as low mass as possible. Acceleration of the tool from the workpiece end (typical of a gantry) will necessarily be at the worst mechanical disadvantage to any such 'topheaviness' from SLM.

Pitch, roll, and yaw control required for precision alignment within depth-of-field.

If tool is not moved by multiply driven axes, entire 'wall' may require motorized kinematic mounting.

One divergent lens may be necessary to correct abberation.

All mirrors may be adaptive - unimorph piezoelectric.

Alternative Non-Objective Lens (optional)

Defocus or long light path may be necessary.

Mirrors may require narrow bandpass at EUV, as first surface mirrors may be the only opportunity to filter broad spectrum from EUV source. Broadly passing >500um (if not >=193nm) is additionally expected and desirable.

Attenuator may improve contrast ratio, reducing exposure during iterative alignment illumination.

Alternate Spectrum Light Source (>=200nm)

High-NA Lens (optional)

Scatter/Morie Cameras

Ultramicroscope Illuminators

Curve all mirrors to cheapen. EUV optical flats may be avoided entirely, especially if scattering modulator and workpiece may not require optical flatness.

Light path must be long if incoherence of light source is relied upon to keep mirror defects or dust far away from SLM focal plane.

photo

beam knife

light source

Only the six numbered projection mirrors may require tight tolerance. Other mirrors (between light source and Spatial Light Modulator), including any rapidly degrading collector mirror, may have much less accurate, much rougher surfaces, possibly as entirely non-imaging mirrors for diffuser, arbitrary, or cost-reduction reasons.

workpiece

Ultra pure water evaporation may wash off dust.

Spectroscopic analysis may be required, possibly necessitating swapping to a separate tool for some use cases.

High-NA Lens (or equivalent folded mirror microscope objective) light path may be at standoff distance and angle from Low-NA mirror light path, to allow Low-NA and High-NA projection simultaneously. Quickly switching from High-NA EUV to Low-NA DUV to minimize EUV light source wear may be worth workarounds to the substantial off-angle abberation and depth-of-field issues. Low-NA mirror stability nonetheless must have priority for the more straightforward optical path.

Fulcrum of any wobbly actuator (ie. gantry linear bearings) must be close to workpiece (ie. a typical gantry supported at the base is the best arrangement for such a tool), to minimize misalignment due to vibration. Placing linear bearings at the top of tool, rather than or in addition to at the bottom close to the workpiece, at best reduces assembly/maintenance convenience for negligible benefit, and may worsen resolution, settling time, etc.

Low latency positioning and adaptive optics feedback is expected necessary. All allignment, abberation, and wavefront correction may depend on iterative overlay optimization from Scatter/Morie Camera measurements.

Wall is used as a dedicated vertical optical table, and may have ultra-fine-thread bushings allowing entire surface to directly provide a kinematic adjustment plate, with the adjustable screws accessible to stepper motors (for iterative overlay optimization) at the reverse side.
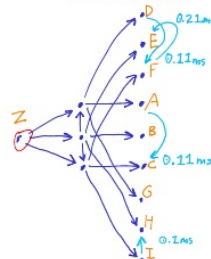
Tempered glass may be used instead of aluminum or invar alloy if charged particle deflection (ie. electron beam distortion) is a possible concern. Apparently most tempered glass is float glass.
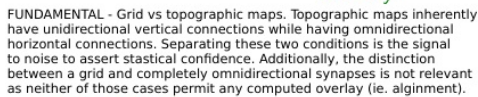
Topographic Mapping from RPT Correlation

Software Algorithm Flow

Low temporal resolution correlations may reveal topographic mappings, but without clearly defining the typical directionality, or possibility of bidirectional feedback, only showing both topographic maps were simultaneously activated.

Some top neurons are likely to directly represent sensorimotor endpoints, or if not, may be calibrated to models of predictable chances across precept fields (eg. point source sweeping across receptive fields, mechDive measured force/position motor outputs) (aka. 'neural decoder').

Iteratively solve red.

Find sensorimotor I/O (PNS) entry.

From orange. Action potentials may overlap with only small spike phase or duration differences.

Read only! Algorithm must NOT require arbitrary stimulation, which should only supplement recording data.

High temporal resolution and oversampled spatial resolution may be required and are feasible, constrained by SerDes bandwidth.

Deep topographic mapping may require high temporal resolution (telodendria ~50kHz?), neuroanatomical overlay (spatial position of electrode), and/or tracing the order of RPT events by RPT correlation of RPT events themselves.

Absence of any spatial position and temporal resolution less than 10x sample rate of minimum temporal difference may increase risk of requiring more solving by more computationally expensive genetic/ANN model iteration.

Neurons which RPT from a common vertical TX may be distinguished by their RPT of other neurons in a specific horizontal topographic map.

Only the RPT event F-->E, which occurs after D-->F, distinguishes E (of D,E,F horizontal) from B (of A,B,C horizontal).

Center of all topographic maps - E,B,H - will RPT simultaneously from the same vertical TX at Z.

Both B and E will RPT from the same vertical TX event. Only E will RPT of horizontal TX events from processing within that horizontal topographic map.

FUNDAMENTAL - Grid vs topographic maps. Topographic maps inherently have unidirectional vertical connections while having omnidirectional horizontal connections. Separating these two conditions is the signal to noise to assert stastical confidence. Additionally, the distinction between a grid and completely omnidirectional synapses is not relevant as neither of those cases permit any computed overlay (ie. alginment).

Common 'Ancestor' (prefer more convoluted path in practice to avoid eg. confusing primary/secondary sensory cortex).

Topographic vector and weight assignments (multiple simultaneously are possible).

FUNDAMENTAL - In practice even substantial misalignment may be tolerable. Minor scaling or layer mismatch, may be adequately accommodated simply by randomizing geometric overlay (ie. alignment) slightly, allowing at least some of the neurons to some of the other neurons. With adequate precision, VR retraining or outright plasticity is expected to be sufficient to adjust sensory perceptions. Moreover, mere VR sensorimotor connection can be achieved by PNS connection which is drastically simpler to align and to supplement by a variety of calibration techniques (aka. 'neural decoder') and mechDive itself.

Biological neural network (ie. 'brain') complexity may be less than tens of thousands of topographic maps. Human Connectome and Human Proteonome projects seem to support such conclusion. Should not be surprising considering the seeming absence of complexity in other tissues derived from similar genetic mechanisms. Much complexity of biological neural networks below horizontal topographic maps (eg. large numbers of distinctly different processing structures, large numbers of distinct neuron morphologies, etc) should not be expected either.
https://www.proteinatlas.org/humanproteonome/brain/human+brain
https://humanconnectomeproject.org

Usage

```
./_consolidate_documents.bat
```
Some larger binary replacement documents (ie. some PDF files) may be written to '_bundle/' to avoid unintentionally adding large binary object output to git history. Move these files to the root of the repository when appropriate.

Design

Mostly uses 'scriptedIllustrator' . Some files may use resources from other files, using path variables defined by './zzLib_800-documents/consolidateVariables.sh' .

Safety

Reference

Copyright