

**Don't ask what you can do for LuaTeX,
but what LuaTeX can do for you.**

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Goal: create a typesetting system

(not related to ConTeXt, LaTeX or similar)

But...

Problem #1

I don't like TeX...

Problem #1

I don't like TeX...the language

but I want to use TeX for typesetting

98% Lua 2% TeX

But...

Example #1: Control flow

`\directlua{...}` vs. `directtex("...")`

There is `\directlua`, but no `directtex()`

This is what you do in LuaTeX
traditionally:

- ▶ `\lots\of\texcode\dontrelax{...}`
`\directlua{calculate.this()}`
`\now\back\to\TeX`

I would like to do it the opposite way

There is `\directlua`, but no `directtex()`

```
\directlua{
```

```
...
```

```
tex.sprint("\setbox\mybox\vbox{whatever}")
```

```
tex.wd["mybox"]
```

```
...
```

```
}
```

directtex()

```
\newbox\mybox  
\newif\ifcontinue\continuetrue
```

```
\directlua{  
directtex = coroutine.yield
```

```
function main_loop()  
  -- lots of lua code  
  directtex("\setbox\mybox\vbox{whatever}")  
  ret = tex.wd.mybox / 2^16  
  -- more lua code  
  
  -- at the end:  
  directtex("\continuefalse")  
end
```

```
co = coroutine.create(main_loop)  
}
```

```
\loop \directlua{  
  ok,str=coroutine.resume(co)  
  tex.sprint(str )  
}\ifcontinue  
\repeat  
\bye
```

Problem #2

So many files in the TeX tree
(lot of i/o, error prone, ugly, ...)

Example #2: Kpathsea Library

- ▶ not needed most of the time
- ▶ confusing (texmf.cnf)
- ▶ not flexible (texhash, zip files)

Example #2: Kpathsea Library

```
luatex --lua myinit.lua myfile.tex
```

```
texconfig.kpse_init=false  
kpse = {}
```

```
filelist = { -- created on startup  
  "a.font"="/location/a.font" ,  
  "b.tex" = "/yet/another/location/b.tex",  
  ...  
}
```

```
function kpse.find_file(filename,what)  
  return filelist[filename] or filelist[filename .. ".tex"]  
end
```

```
callback.register('find_read_file',  
  function(id_number,asked_name)  
    return kpse.find_file(asked_name)  
  end  
)
```

```
... more callbacks
```

```
... more read_..._file handlers (bug in LuaTeX?)
```

Example #3: Hyphenation patterns

You can have all patterns in one (.lua) file

```
l=lang.new() ;  
l:patterns("  
.a6  
.ab3b  
.aben2  
.ab5l  
.abo4  
.ab3ol  
.ab1or  
...  
zzi3s2  
z3zo  
zzoll2")  
-- l:id is now the language id
```

more examples:

- ▶ XML parsing with LPEG
- ▶ font families with Lua

But...

Some problems remain

- ▶ not everything can be done inside lua (`\vbox`, `\font`)
- ▶ see discussions about embed / extend and Luigi's "lunatic"
- ▶ is the license of LuaTeX problematic?
- ▶ more control needed:
`pdf.setpos(x,y)`

Example #4: PDF Layers

```
\directlua{
view  = pdf.immediateobj("<< /Type/OCG /Name (View) >>") .. " 0 R "
print = pdf.immediateobj("<< /Type/OCG /Name (Print) >>") .. " 0 R "

order = pdf.immediateobj(" [ " .. view .. print .. "] ")
on     = pdf.immediateobj(" [ " .. view .. "] ")
off    = pdf.immediateobj(" [ " .. print .. "] ")
ocgs   = pdf.immediateobj(" [ " .. view .. print .. "] ")
}

\pdfcatalog{
  /OCProperties << /OCGs \directlua{tex.sprint(ocgs)}
    /D<< /Order \directlua{tex.sprint(order)}
      /OFF \directlua{tex.sprint(off)}
      /ON  \directlua{tex.sprint(on)}
    >> >> }

\edef\x{\pdfpageresources{ /Properties << /OCView
  \directlua{tex.sprint(view)}
  /OCPrint \directlua{tex.sprint(print)} >> } }
\x

\pdfliteral page {/OC/OCPrint BDC} hello
\pdfliteral page {EMC/OC/OCView BDC} nice
\pdfliteral {EMC} world
\bye
```

Conclusion

- ▶ You can use Lua as the main language
- ▶ TeX can be used as a library to some extend
- ▶ Some limitations that will be resolved
- ▶ A few unanswered questions
- ▶ **LuaTeX is really great!**

**Don't ask what you can do for LuaTeX,
but what LuaTeX can do for you.**

Thank you for listening