

Dror Bar - Natan: Odds, Ends, Unfinished: Academic Pensieve:

Mathematica Assembly File

Pensieve Header: This notebook assembles the web version of my academic pensieve.

Actions

■ Assemble All

```
Print[Date[]];
AcademicPensieveAssemble["all"];
{2009, 1, 23, 20, 6, 8.2154000}
Exporting C:\drorbn\AcademicPensieve\Assemble.nb
into C:\drorbn\AcademicPensieve\nb\Assemble.pdf ...
Exporting C:\drorbn\AcademicPensieve\PublicNotebook\2009-01.one
into C:\drorbn\AcademicPensieve\2009-01\one\ ...
Writing C:\drorbn\AcademicPensieve\2009-01\one\Doubling_the_Cartan.pdf ...
C:\drorbn\AcademicPensieve\2009-01\index.html
C:\drorbn\AcademicPensieve\2009-01\one\index.html
C:\drorbn\AcademicPensieve\index.html
```

■ Convert all .nb Files

```
AcademicPensieveAssemble["nb"]
Exporting C:\drorbn\AcademicPensieve\Assemble.nb
into C:\drorbn\AcademicPensieve\nb\Assemble.pdf ...
```

■ Convert all .one Files

```
AcademicPensieveAssemble["one"];
Exporting C:\drorbn\AcademicPensieve\PublicNotebook\2008-12.one
into C:\drorbn\AcademicPensieve\2008-12\one\ ...
Writing C:\drorbn\AcademicPensieve\2008-12\one\Reading_Furusho.pdf ...
Exporting C:\drorbn\AcademicPensieve\PublicNotebook\Annotations\2008.one
into C:\drorbn\AcademicPensieve\Annotations\2008\one\ ...
```

■ Make thumbnails for all images

```
AcademicPensieveAssemble["thumbs"]
```

Create Index Pages

```
AcademicPensieveAssemble ["indexes"]
```

■ AcademicPensieveAssembleRandom.php

```
AcademicPensieveAssemble ["random.php"]
```

```
C:\drorbn\AcademicPensieve\random.php
```

■ Delete all TOC files

```
DeleteFile /@ FileNames["TOC.m", {AcademicPensieveDirectory}, Infinity];
```

■ Delete all index files

```
DeleteFile /@ FileNames["index.html", {AcademicPensieveDirectory}, Infinity];
```

Programs

■ Assemble All

```
BeginPackage ["AcademicPensieve`"];
AcademicPensieveDirectory = "C:\\drorbn\\AcademicPensieve";
AcademicPensieveAssemble ["all"] :=
  AcademicPensieveAssemble /@ {"nb", "one", "thumbs", "indexes", "random.php"};
EndPackage []
```

■ Utilities / General

```
BeginPackage ["AcademicPensieve`"]; Begin["`Private`"];
RootDir = AcademicPensieveDirectory;
StripRootDir[s_] := StripDir[s, RootDir];
StripDir[s_, sdir_] := Module[{dir},
  dir = StringReplace[s, sdir -> ""];
  While[dir != "" && (StringTake[dir, 1] == "\\ " || StringTake[dir, 1] == "/"),
    dir = StringDrop[dir, 1]
  ];
  dir
];
KosherFilename[s_String] := StringReplace[s, {
  " " -> "_", ":" -> "-", "/" -> "-", "?" -> "Q", "\" -> "'"
}];
End[]; EndPackage []
```

- For .nb files

```

BeginPackage["AcademicPensieve`"]; Begin["`Private`"];
OpenNotebooks = Notebooks [];
NB2PDF[NotebookFilename_String] := Module[
  {SplitName, PDFFilename, PDFDir, nb, TOCFilename, toc, summary},
  SplitName = StringSplit[NotebookFilename, {"\\", "/"}];
  PDFFilename = ToFileName[
    PDFDir = ToFileName[Append[Drop[SplitName, -1], "nb"]],
    StringDrop[Last@SplitName, -2] <> "pdf"
  ];
  If[
    Or[
      FileType[PDFFilename] === None,
      AbsoluteTime[FileDate[PDFFilename]] < AbsoluteTime[FileDate[NotebookFilename]]
    ],
    Print["Exporting ", NotebookFilename, " into ", PDFFilename, " ..."];
    If[FileType[PDFDir] === None, CreateDirectory[PDFDir]];
    NotebookPrint[nb = NotebookOpen[NotebookFilename], PDFFilename];
    TOCFilename = ToFileName[PDFDir, "TOC.m"];
    If[FileType[TOCFilename] != File, toc = {},
      toc = Get[TOCFilename]
    ];
    summary = Cases[
      NotebookGet[nb],
      cc_String?(StringMatchQ[#, ("Pensieve Header: ") ~~ ___] &),
      Infinity, 1
    ];
    toc = DeleteCases[toc, StringDrop[Last@SplitName, -3] -> _];
    If[summary != {},
      AppendTo[toc, StringDrop[Last@SplitName, -3] -> StringDrop[First[summary], 17]]
    ];
    Put[toc, TOCFilename];
    If[! MemberQ[OpenNotebooks, nb], NotebookClose[nb]];
  ];
  PDFFilename
];
AcademicPensieveAssemble["nb"] := Module[
  {legits, orphans},
  legit = NB2PDF /@ FileNames["*.nb", {RootDir}, Infinity];
  orphans = Complement[
    Flatten[
      If[FileType[#] === Directory,
        FileNames["*", {#}],
        {}
      ] & /@ FileNames["nb", {RootDir}, Infinity]
    ],
    legit,
    FileNames["index.html" | "TOC.m", {RootDir}, Infinity]
  ];
  DeleteFile[orphans]
];
End[]; EndPackage[]

```

For .one files

More on the Mathematica / .NET interface is at <http://reference.wolfram.com/mathematica/NETLink/tutorial/CallingNETFrom-Mathematica.html>

```

BeginPackage["AcademicPensieve`"]; Begin["`Private`"];
Needs["NETLink`"];
If[! NETObjectQ[OneNoteLink],
  InstallNET[];
  OneNoteLink = CreateCOMObject["OneNote.Application"]
];
One2PDF[OneNoteFilename_String] := Module[
{
  SplitName, PDFDirectory, OneNoteDocument,
  XMLString, XML, PageDescriptors, legits = {}, tocfile
},
SplitName = StringSplit[OneNoteFilename, {"\\", "/" }];
PDFDirectory = ToFileName[Flatten[{
  DeleteCases[Drop[SplitName, -1], "PublicNotebook" | "old"],
  {StringDrop[Last@SplitName, -4], "one"}
}]];
If[
! Or[
  FileType[PDFDirectory] === None,
  FileType[ToFileName[PDFDirectory, "TOC.m"]] === None,
  AbsoluteTime[FileDate[PDFDirectory]] < AbsoluteTime[FileDate[OneNoteFilename]]
],
(* Print["Skipping ", OneNoteFilename, "."] *),
Print["Exporting ", OneNoteFilename, " into ", PDFDirectory, "\\ ..."];
If[FileType[PDFDirectory] === None, CreateDirectory[PDFDirectory]];
OneNoteLink@OpenHierarchy[OneNoteFilename, "", OneNoteDocument];
OneNoteLink@GetHierarchy[OneNoteDocument, 4, XMLString];
XML = ImportString[XMLString, "XML"];
PageDescriptors = Cases[XML, XMLElement[[_ , "Page"], page_, {}] -> page, Infinity];
legits = OnePage2PDF[#, PDFDirectory] & /@ PageDescriptors;
Put[XML, tocfile = ToFileName[PDFDirectory, "TOC.m"]];
AppendTo[legits, tocfile];
DeleteFile[Complement[FileNames["*", PDFDirectory], legits]]
];
];
OnePage2PDF[desc_List, dir_String] := Module[
{ID, name, dateTime, lastModifiedTime, pdffilename},

```

```

{ID, name, dateTime, lastModifiedTime} =
  {"ID", "name", "dateTime", "lastModifiedTime"} /. desc;
pdffilename = ToFileName[dir,
  KoshersFilename[name] <> ".pdf"
];
If[
  Or[
    FileType[pdffilename] === None,
    AbsoluteTime[DatePlus[FileDate[pdffilename], {- $TimeZone, "Hour"}]] <
      AbsoluteTime[lastModifiedTime]
  ],
  Print["Writing ", pdffilename, " ..."];
  If[FileType[pdffilename] != None, DeleteFile[pdffilename]]
  OneNoteLink@Publish[ID, pdffilename, 3, ""]
];
pdffilename
];
AcademicPensieveAssemble["one"] := If[!NETObjectQ[OneNoteLink],
  $Failed, One2PDF /@ FileNames["*.one", {RootDir}, Infinity];];
AcademicPensieveAssemble["one"] := If[!NETObjectQ[OneNoteLink], $Failed,
  One2PDF /@ FileNames["*.one", {RootDir}, Infinity]
];
End[]; EndPackage[]

```

■ Make Thumbnails

```

BeginPackage["AcademicPensieve`"]; Begin["`Private`"];
ImageTypes = (*.jpg | *.gif | *.png);
MakeThumb[ImageFilename_String] := Module[
  {SplitName, ThumbFilename, ThumbDir},
  SplitName = StringSplit[ImageFilename, {"\\", "/" }];
  ThumbFilename = ToFileName[
    ThumbDir = ToFileName[Append[Drop[SplitName, -1], "thumbs"],
    Last@SplitName
  ];
  If[
    And[
      SplitName[[-2]] != "thumbs",
      Or[
        FileType[ThumbFilename] === None,
        AbsoluteTime[FileDate[ThumbFilename]] < AbsoluteTime[FileDate[ImageFilename]]
      ]
    ],
    Print["Thumbnailing ", ImageFilename, " into ", ThumbFilename, " ..."];
    If[FileType[ThumbDir] === None, CreateDirectory[ThumbDir]];
    Export[ThumbFilename, ImageResize[Import[ImageFilename], {120}]];
  ];
  ThumbFilename
];
AcademicPensieveAssemble["thumbs"] := Module[
  {legits, orphans},
  legit = MakeThumb /@ FileNames[ImageTypes, {RootDir}, Infinity];
  orphans = Complement[
    Flatten[
      If[FileType[#] === Directory,
        FileNames["*", {#}],
        {}
      ] & /@ FileNames["thumbs", {RootDir}, Infinity]
    ],
    legit,
    FileNames["index.html", {RootDir}, Infinity]
  ];
  DeleteFile[orphans]
];
End[]; EndPackage[]

```

■ Cell Extraction

```
BeginPackage["AcademicPensieve`"]; Begin["`Private`"];
Clear[ExtractDataCell];
ExtractDataCell[cn_String] := ExtractDataCell[cn] = First[Cases[
  NotebookGet[EvaluationNotebook[]],
  Cell[
    cc_String?(StringMatchQ[#, ("Data Cell " <> cn <> ":\n") ~~ ___] &),
    "Text", ___
  ] => Last[StringSplit[cc, "\n", 2]],
  Infinity, 1
]];
ExtractDataCell /@ {"Index Template", "random.php"};
End[]; EndPackage[]
```


■ Assemble Index Pages

```

BeginPackage["AcademicPensieve`"]; Begin["`Private`"];
AssembleIndexPage[s_String] := Module[
  {
    dir, fulldir, Customizations, parentdir, next, previous, siblings, p, fname, t, d,
    SplitPath, l, FullTitle, Title, Navigator, i, j, OneNotePages, OneNoteData,
    NBDir, NBTOCFilename, NBTOC, MathematicaNotebooks, NBFileNames, ThumbsDir,
    Images, ImageFileNames, DirectoryListing, FileListing, last, htmlfile
  },
  dir = StripRootDir[s];
  fulldir = ToFileName[RootDir, dir];
  Customizations = ToFileName[fulldir, "index.m"];
  Customizations = If[FileType[Customizations] === File, Get[Customizations], {}];
  If[dir === "", next = previous = "AcademicPensieve",
    parentdir =
      StringReplace[fulldir, par__ ~~ Shortest[{"\\", "/"} ~~ __ ~~ EndOfString] -> par];
    siblings = Select[FileNames["*", parentdir], FileType[#] === Directory &];
    l = Length[siblings];
    {{p}} = Position[siblings, fulldir];
    next = StripDir[siblings[[1 + Mod[p, l]]], parentdir];
    previous = StripDir[siblings[[1 + Mod[p - 2, l]]], parentdir];
  ];
  fname = ToFileName[fulldir, "index.html"];
  If[
    ! Or[
      FileType[fname] === None,
      (t = AbsoluteTime[FileDate[fname]]) < AbsoluteTime[FileDate[fulldir]],
      FileType[d = ToFileName[fulldir, "nb"]] === Directory && t < Max[
        AbsoluteTime[FileDate[#]] & /@ FileNames["*.pdf", d]
      ],
      FileType[d = ToFileName[fulldir, "one"]] === Directory &&
      t < AbsoluteTime[FileDate[d]]
    ],
    (* Print["Skipping ", fulldir, "."] *)
    l = Length[SplitPath = Prepend[StringSplit[dir, {"\\", "/"}], "AcademicPensieve"]];
    FullTitle = StringJoin[({# <> ": " & /@ SplitPath];
    Title = Last[SplitPath];
    Navigator = StringJoin[Table[
      StringJoin[
        "<a href=\"",

```

```

StringJoin[Table["../", {1 - i}]],
  "index.html\">" <> SplitPath[[i]] <> "</a>: "
],
{i, 1 - 1}
]];
OneNotePages = If[FileType[ToFileName[{fulldir, "one"}, "TOC.m"]] === None, "",
OneNoteData = Get[ToFileName[{fulldir, "one"}, "TOC.m"]][[2, 3, All, 2]];
StringJoin[
  "<h2>Notebook Pages</h2>\n",
  "NotebookPagesNotes " /. Customizations /. "NotebookPagesNotes " → "",
  "<table border=1 cellpadding=0>\n",
  "<tr><th>Page</th><th>Created</th><th>Last Modified</th></tr>\n",
  StringJoin[StringJoin[
    "<tr align=left>\n",
    StringJoin[
      " <td>",
      If[("isSubPage" /. #) == "true", "--- ", ""],
      "<a href=\"one/",
      KoshersFilename["name" /. #],
      ".pdf\">",
      "name" /. #,
      "</a></td>\n"
    ],
    ],
    " <td>" <>
    StringReplace["dateTime" /. #, {"T" → " ", ".000Z" → ""}] <> " UT</td>\n",
    " <td>" <> StringReplace["lastModifiedTime" /. #,
      {"T" → " ", ".000Z" → ""}] <> " UT</td>\n",
    "</tr>\n"
  ] & /@ OneNoteData],
  "</table>"
]
];
NBDir = ToFileName[fulldir, "nb"];
MathematicaNotebooks = If[FileType[NBDir] != Directory, "",
NBTOCFilename = ToFileName[NBDir, "TOC.m"];
NBTOC = If[FileType[NBTOCFilename] != File, {}, Get[NBTOCFilename]];
l = Length[
  NBFileNames =
  StringTake[StringReplace[#, NBDir → ""], {2, -5}] & /@ FileNames["*.pdf", NBDir]
];
StringJoin[
  "<h2>Mathematica Notebooks</h2>\n",
  "MathematicaNotebooksNotes " /. Customizations /.

```

```

    "MathematicaNotebooksNotes " → "",
    "<table border=1 cellspacing=0>\n",
    "<tr><th>Notebook
      (.pdf)</th><th>Source (.nb)</th><th>Summary</th></tr>\n",
    StringJoin[
      StringJoin[
        " <tr align=left>",
        "<td><a href=\"nb/\", #, \".pdf\">", #, "</a></td>",
        "<td align=center><a href=\"", #, ".nb\">source</a></td>",
        "<td>", (# /. NBTOC) /. # → "&nbsp;", "</td>"
      ] & /@ NBFileNames
    ],
    "</table>\n"
  ]
];

ThumbsDir = ToFileName[fulldir, "thumbs"];
Images = If[FileType[ThumbsDir] != Directory, "",
  ImageFileNames = StringDrop[StringReplace[#, ThumbsDir → ""], 1] & /@
  FileNames[ImageTypes, ThumbsDir];
StringJoin[
  "<h2>Images</h2>\n",
  "<table border=0 cellspacing=5 width=100%>\n",
  StringJoin[
    i = 0;
    StringJoin[
      ++i;
      If[OddQ[i], " <tr>", ""],
      "<td width=125 align=center><a href=\"",
      #, "\"><img src=\"thumbs/\", #, "\"></a></td>",
      "<td align=left><a href=\"", #, "\">", #, "</a></td>",
      If[EvenQ[i], "</tr>\n", ""]
    ] & /@ ImageFileNames
  ],
  If[OddQ[i], "</tr>\n", ""],
  "</table>\n"
]
];

FileListing = FileNames["*", {fulldir}];
DirectoryListing = Select[FileListing, FileType[#] == Directory &];
FileListing = StringJoin[(
  last = Last[StringSplit[#, {"\\", "/"}]];
  " <a href=\"\" <> last <> \">\" <> last <> "</a>&nbsp;&nbsp;&nbsp;\n"
) & /@ Complement[FileListing, DirectoryListing]];

```

```

DirectoryListing = StringJoin[(
    last = Last[StringSplit[#, {"\\", "/"}]];
    " <a href=\"" < last < "/index.html\" > last < "</a>&nbsp;&nbsp;&nbsp;\n"
) & /@ DirectoryListing];
htmlfile = OpenWrite[fname];
WriteString[htmlfile,
StringReplace[ExtractDataCell["Index Template"], {
    "<#FullTitle#" → FullTitle,
    "<#Title#" → Title,
    "<#next#" → next,
    "<#previous#" → previous,
    "<#Navigator#" → Navigator,
    "<#OneNotePages#" → OneNotePages,
    "<#MathematicaNotebooks#" → MathematicaNotebooks,
    "<#Images#" → Images,
    "<#FileListing#" → FileListing,
    "<#DirectoryListing#" → DirectoryListing
}]]];
Print[Close[htmlfile]]
];
AcademicPensieveAssemble["indexes"] := (
    AssembleIndexPage /@
    Select[FileNames["*", RootDir, Infinity], FileType[#] == Directory &];
    AssembleIndexPage[""];
);
End[]; EndPackage []

```

■ Assemble Random.php

```

BeginPackage["AcademicPensieve`"]; Begin["`Private`"];
AcademicPensieveAssemble["random.php"] := Module[
    {phpfile},
    phpfile = OpenWrite[ToFileName[RootDir, "random.php"]];
    WriteString[phpfile,
    StringReplace[ExtractDataCell["random.php"], {
        "<#DB#" → StringDrop[StringJoin[
            StringJoin[
                "\",",
                StringDrop[StringReplace[#, {RootDir → "", "\\\" → "/}], 1],
                "\",\n"
            ] & /@ FileNames["*.html" | "*.pdf", {RootDir}, Infinity]
        ], -2]
    }]]];
    Close[phpfile]
];
End[]; EndPackage []

```


■ Random.php

Data Cell random.php:

```
<! Script generated - do not edit! >
<?php
$db = array (
<#DB#>
);
$rand= $db[array_rand($db)];
echo "<meta http-equiv=refresh content=\"0; url=$rand\">";
?>
```

Experiments

■ Do I need an image browser?

```
FileNames ["*.jpg" | "*.png" | "*.gif", {AcademicPensieveDirectoty}, Infinity]
{C:\drorbn\AcademicPensieve\2008-02\Notes Project.png,
C:\drorbn\AcademicPensieve\2008-12\AnIdealKnot.jpg, C:\drorbn\AcademicPensieve\Icon.png}
```