

BIL-T CONFERENCE ARTIFICIAL INTELLIGENCE

JULY 8 2021



An Association for All IT Architects



Extracting Text From Objects using AI

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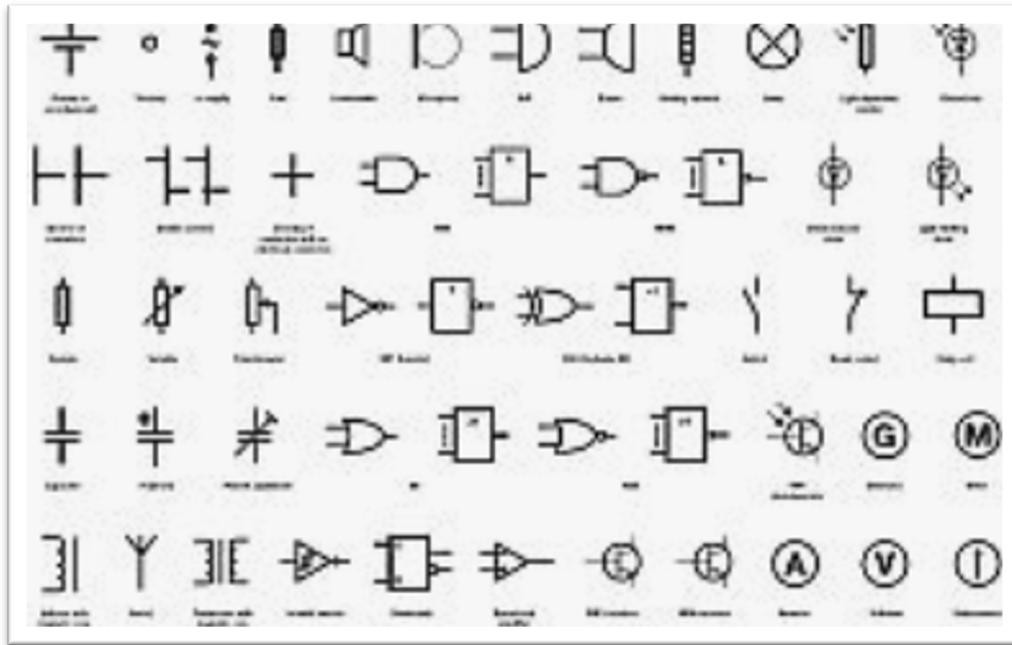
Session learning objective

- At the end of this session, you should be better able to...
 - Use forms recognition to train a model to detect certain objects
 - Configure Cognitive Services to OCR documents
 - Combine the output of both services to retrieve certain text
 - Implement logic in Power Automate that executes when a new document is added to a SharePoint library



The Problem

Standardized Symbols/objects



Text varies in the symbol



Thousands of diagrams

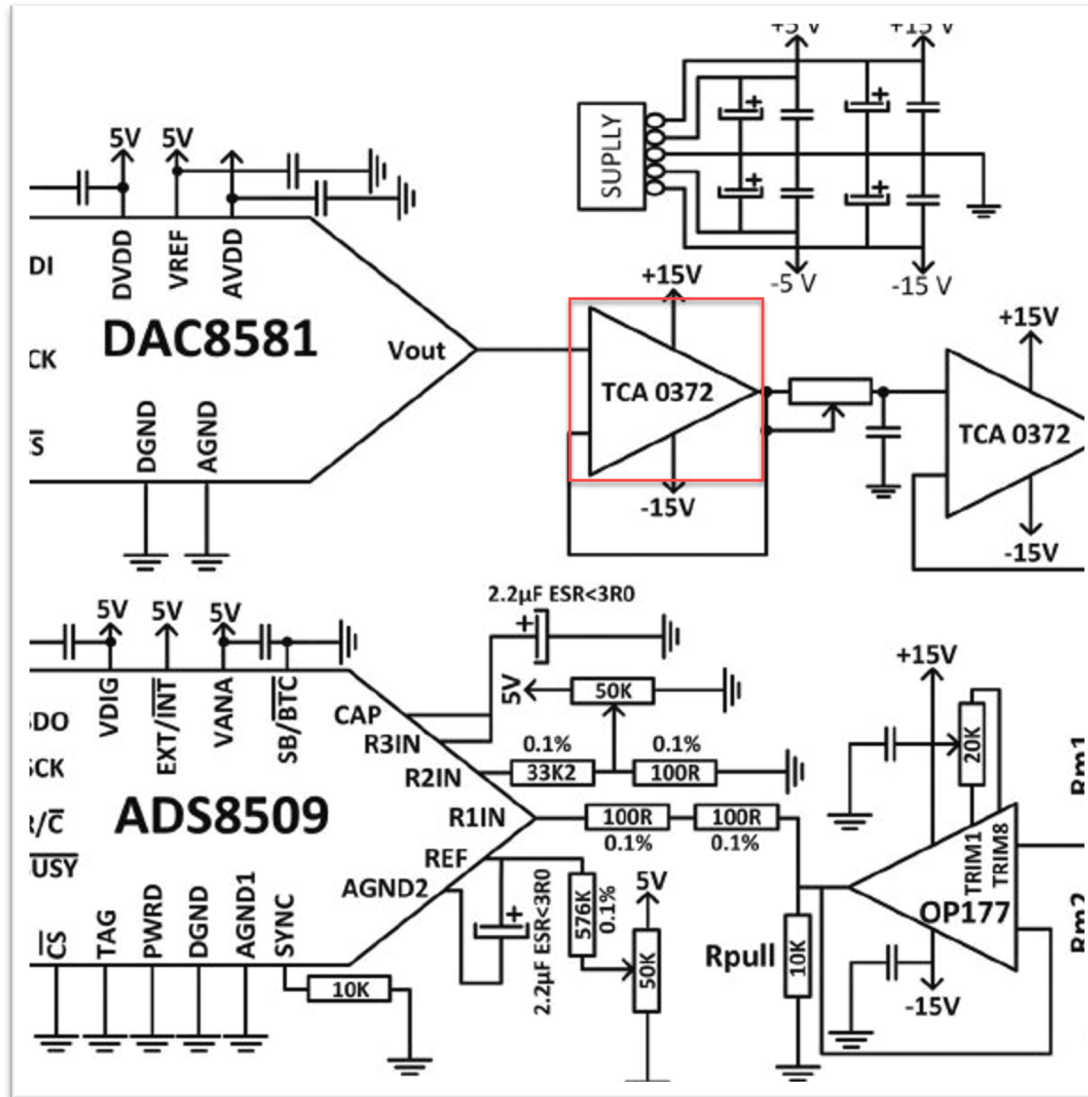


Manual metadata assignment is feasible



Searching produces incomplete results

Schematic Diagrams



Text in symbol has value



CAD licenses are expensive

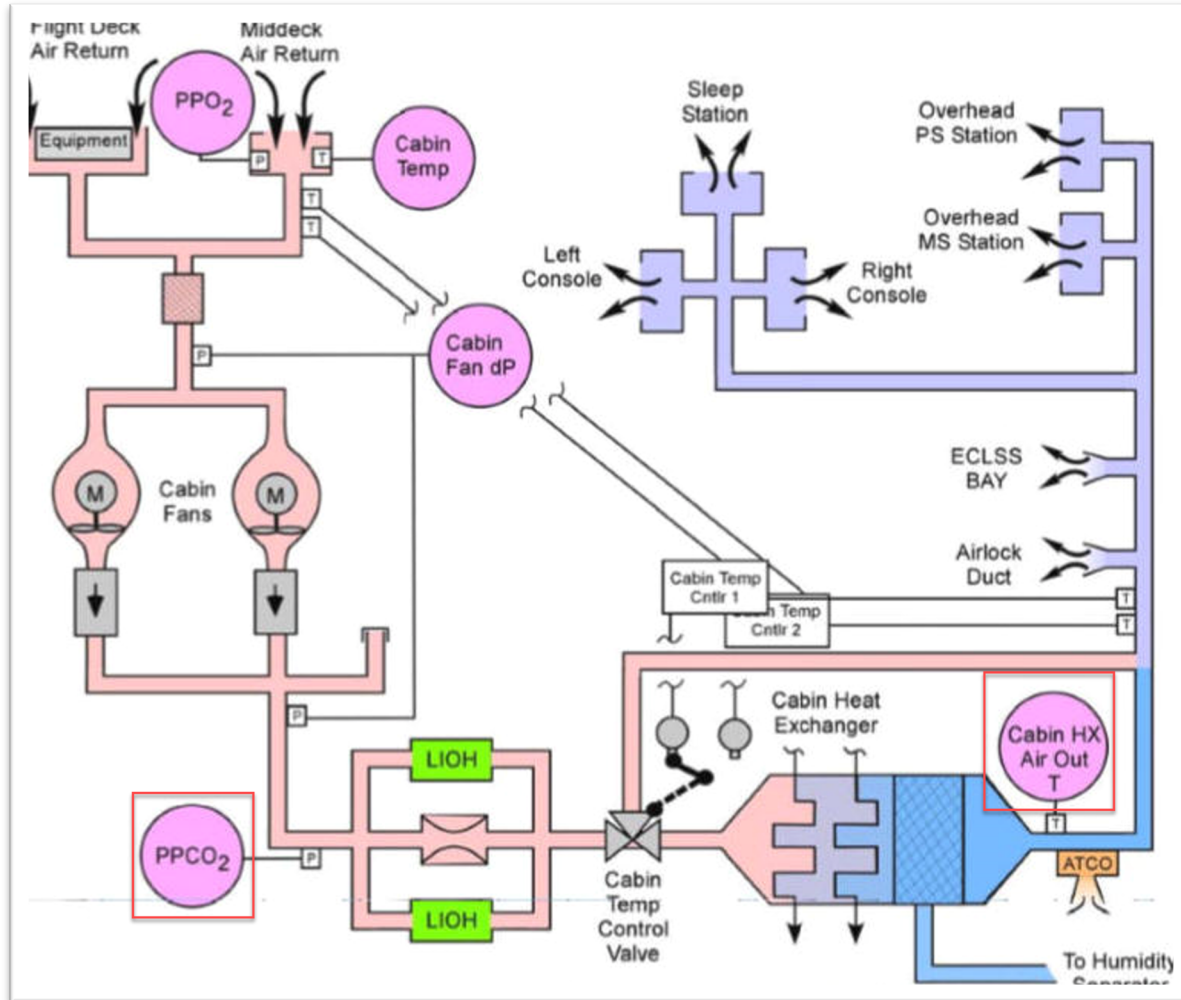


Thousands of components across several plants



Search for components that are out of stock

Manufacturing Components



Preventative maintenance planning



Exposure of a component failure across the organization



Industrial engineers can isolate components



Object Detection

Object Detection

- Identify, count and locate objects in images
- Outcome is JSON file with object detected and pixel coordinates (not text)

AI Builder



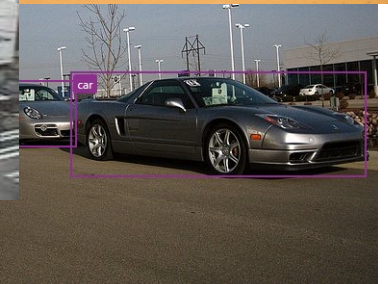
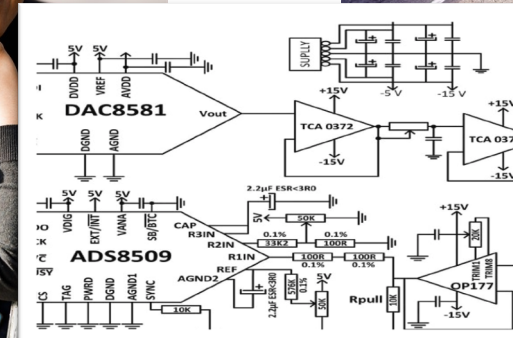
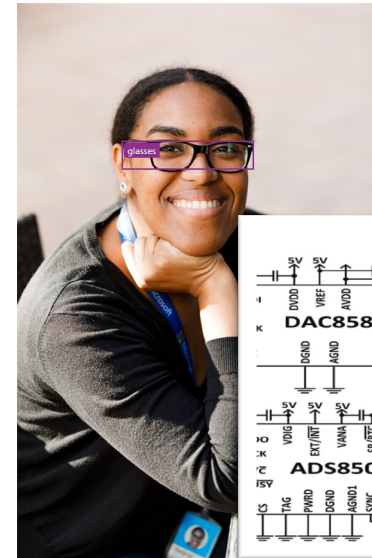
< 1 hour



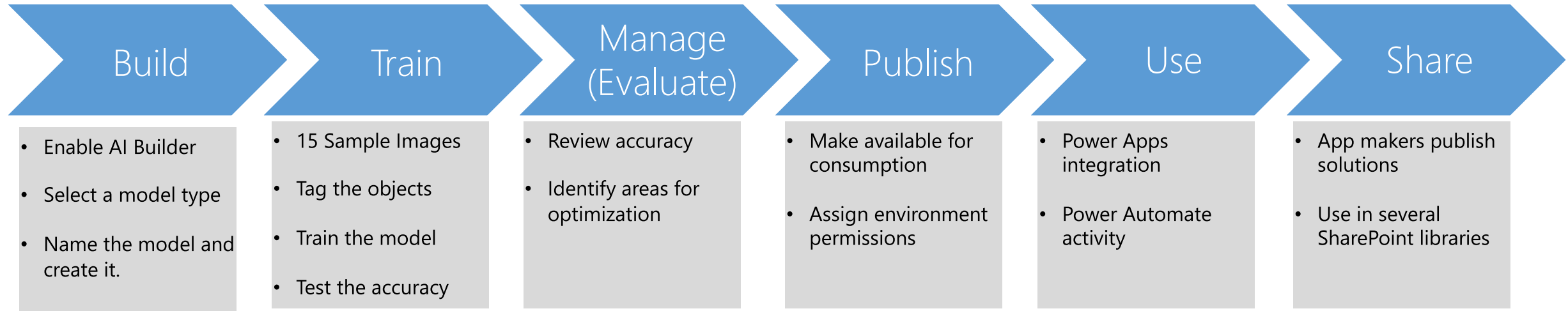
Point & Click



Process
Automation



AI Model Steps



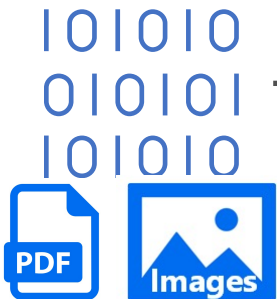


Forms Recognition

At a high level...

INGEST

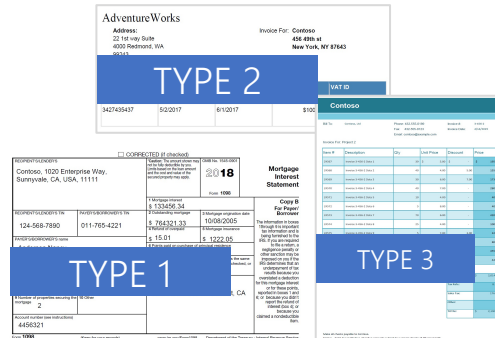
Extract text from documents



Ingest and extract text from Images (png, jpg, etc) PDFs (text or scanned)

CLUSTER

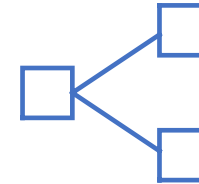
Extract text from documents



Identify the different types of forms and cluster them

DISCOVER

Discovers keys and tables



Learns the structure of your documents & discovers the keys and tables

EXTRACT

Extract Key value pairs and tables

Key	Value
First Name	Neta
Last Name	Haiby
Date	1/3/2019
Customer Acct #	23490523
Invoice #	9080023
Vendor	Microsoft

Associated values to keys and table rows to table headers. Bounding box and confidence.

Form Recognizer Service

Data extraction in any business process that intakes forms and outputs structured data

AdventureWorks

Address:
22 1st way Suite
4000 Redmond, WA
99243

Invoice For: Contoso
456 49th st
New York

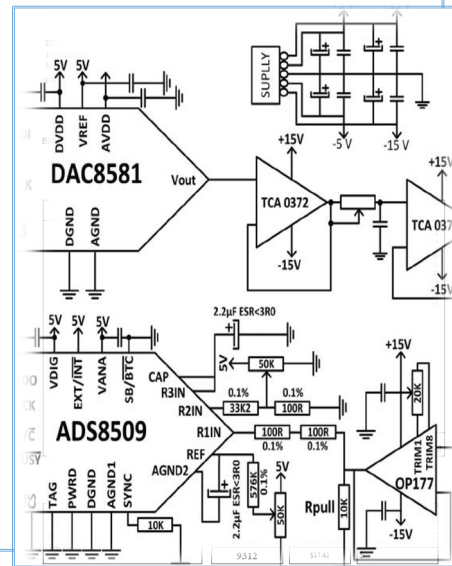
Date Charges

\$1002

CORRECTED (if checked)		Caution: The amount shown may not be fully deductible by you. Limits based on the loan amount and the cost and value of the secured property may apply.		OMB No. 1545-0001 2018 Form 1098	Mortgage Interest Statement
RECIPIENT'S/LENDER'S Contoso, 1020 Enterprise Way, Sunnyvale, CA, USA, 11111		1 Mortgage interest \$ 133456.34		Copy B For Payer/ Borrower	
RECIPIENT'S/LENDER'S TIN 124-568-7890	PAYER'S/BORROWER'S TIN 011-765-4221	2 Outstanding mortgage \$ 764321.33	3 Mortgage origination date 10/08/2005	The information in boxes 1 through 9 is important tax information and is being furnished to the IRS. If you are required to file a return, a negligence penalty or other sanction may be imposed on you if the IRS determines that an underpayment of tax results because you overstated a deduction for this mortgage interest or for these points, reported in boxes 1 and 6, or because you didn't report the refund of interest in box 4, or because you claimed a nondeductible item.	
PAYER'S/BORROWER'S name Anderson Nancy		4 Refund of overpaid \$ 15.01	5 Mortgage insurance \$ 1222.05		
Street address (including apt. no.) 123 Main Street 2, apt 10		6 Points paid on purchase of principal residence \$ 7567.55			
City or town, state or province, country, and ZIP or foreign postal code Redmond WA, USA, 22222		7 <input type="checkbox"/> If address of property securing mortgage is the same as PAYER'S/BORROWER'S address, the box is checked, or the address or description is entered in box 8.			
8 Address 1025 El-Camino Real Street, CA					
9 Number of properties securing the mortgage 2	10 Other mortgage 4456321				
Form 1098 (Keep for your records) www.irs.gov/Form1098 Department of the Treasury - Internal Revenue Service					



INPUT: Documents



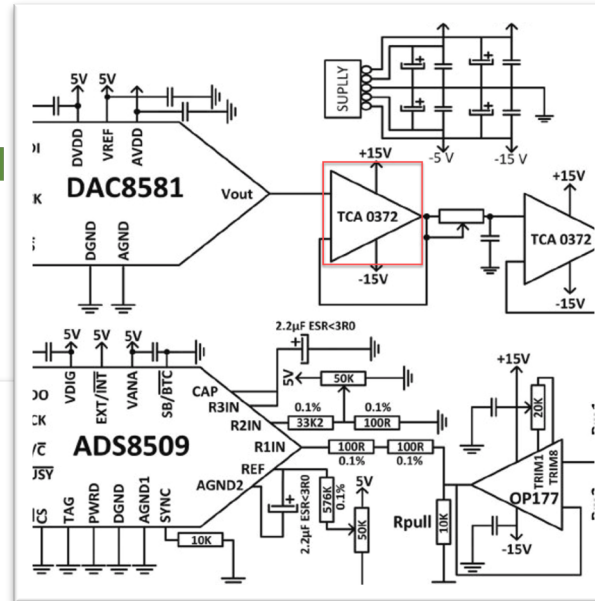
```
{
  "text": "TCA 0372",
  "appearance": {
    "style": {
      "name": "other",
      "confidence": 1
    }
  },
  "words": [
    {
      "boundingBox": [
        103,
        20,
        131,
        20,
        131,
        29,
        103,
        29
      ],
      "text": "TCA 0372",
      "confidence": 0.957
    }
  ]
}
```

OUTPUT: Structured Data
Key Pair Values and Tables

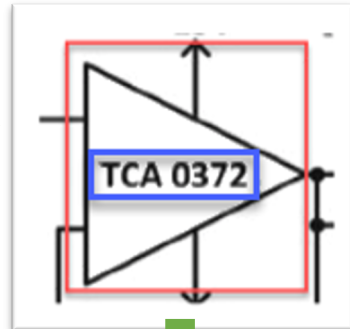
Overlay the coordinates

AI Builder

```
"@odata.type": "#Microsoft.Dynamics.CRM.expando",  
"tagId": "e71b645a-2b52-43cd-9cb7-a8dc79e29b4e",  
"tagName": "Transistor",  
"confidence": 0.61818665,  
"boundingBox": {  
  "@odata.type": "#Microsoft.Dynamics.CRM.expando",  
  "left": 0.11579527,  
  "top": 0.016803563,  
  "width": 0.34265542,  
  "height": 0.42543322,  
  "polygon": {  
    "@odata.type": "#Microsoft.Dynamics.CRM.expando",  
    "coordinates@odata.type": "#Collection(Microsoft.Dynamics.CRM.crmbaseentity)",  
    "coordinates": [  
      {  
        "@odata.type": "#Microsoft.Dynamics.CRM.expando",  
        "x": 0.11579527,  
        "y": 0.016803563
```



Intersect Pixel Location



Extract Text in the boundary of the object

TCA 0372

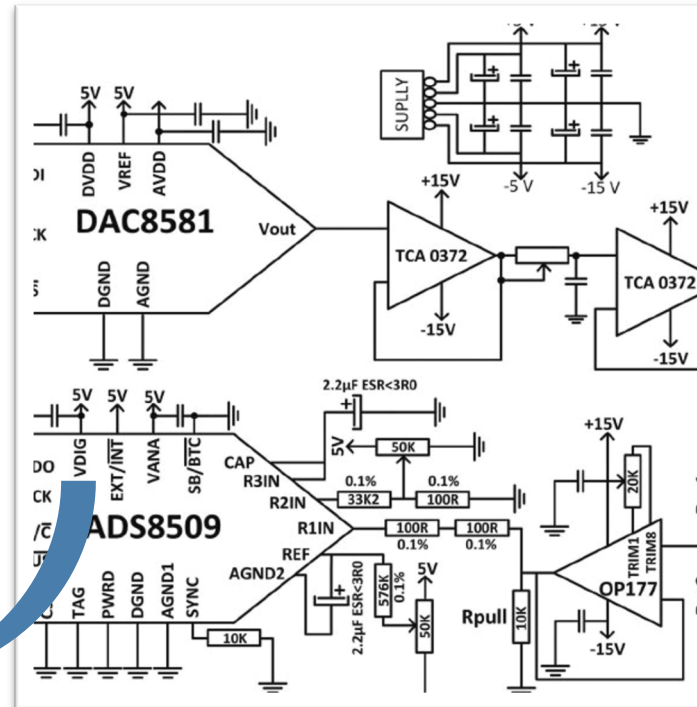
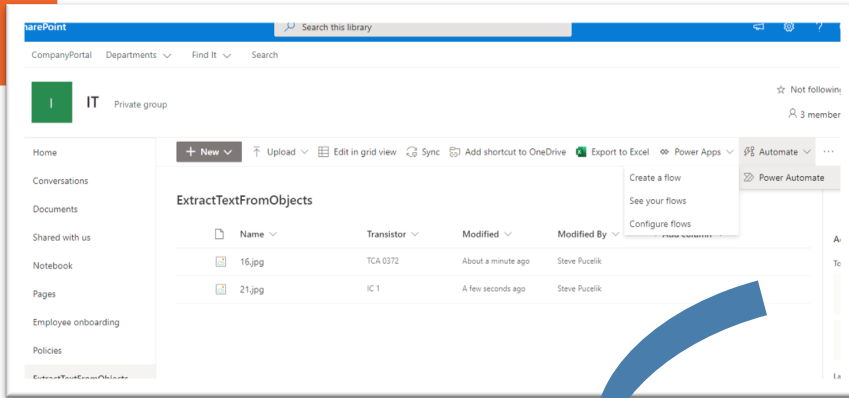
Forms Recognizer Service

```
"text": "TCA 0372",  
"appearance": {  
  "style": {  
    "name": "other",  
    "confidence": 1  
  }  
},  
"words": [  
  {  
    "boundingBox": [  
      103,  
      20,  
      131,  
      20,  
      131,  
      29,  
      103,  
      29  
    ],  
    "text": "TCA 0372",  
    "confidence": 0.957  
  }  
]
```




Automation Tools

Automate metadata extraction using PowerAutomate



Power Automate Activity



Scans images



Extract text from the object



Update SharePoint Library

User Experience



Search



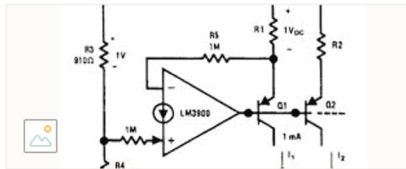
View Documents

Diagram Search

SP Steve Pucelik

LM*

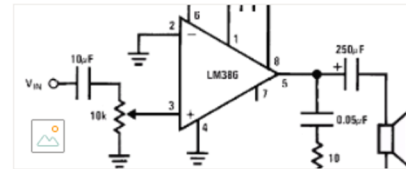
3 results for 'LM*'



17.jpg

LM350D

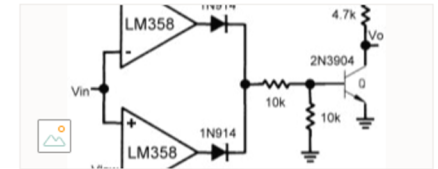
Steve Pucelik
July 2, 2021



27.jpg

2 1 8 LM386 5 3

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July 2, 2021



21.jpg

Vhigh 1N914 LM358; 1N914 LM358 Vlow
www.interfacebus.com;

Steve Pucelik
June 26, 2021



Demo





Questions??

A laptop is open on a desk, displaying the Adobe Lightroom interface. The screen shows a landscape photo of trees in a misty or snowy environment. The interface includes a 'Library' tab at the top, a 'Navigator' panel on the left, a central preview area, a 'Histogram' panel on the right, and a filmstrip at the bottom. The background of the image is a blurred desk with a lamp and a potted plant.

For further information, please contactus@iasaglobal.org