

Geocoding Tutorial using GeoPinpoint Suite

Geocoding involves assigning latitude and longitude coordinates to an item described in terms of its postal address. There are different ways to geocode. This tutorial will describe how to geocode a set of Canadian addresses using DMTI's GeoPinpoint Suite and display them as points in ArcGIS.

Your data should be formatted so that you have headings for city and province. Also, postal codes should not have spaces (e.g., M3K1S7). The address can be unparsed or parsed. Unparsed means that the street number and street name are together in one field, parsed means that you have separate fields for street number and street name (e.g., "41 Ancaster Rd" vs. "41" and "Ancaster Rd"). For the tutorial example, we will use unparsed addresses.

Note: The tutorial assumes that you are starting with a Microsoft Excel spreadsheet, where each row is an address. It will walk you through the steps to convert this into a Microsoft Access database because GeoPinpoint software only works with Access databases. If your data is already in Microsoft Access database format or you already know how to convert an Excel spreadsheet into an Access database, then skip to step 9. This tutorial uses Microsoft Excel 2002 and Microsoft Access 2002.

 Ensure that your spreadsheet of data conforms to the guidelines above. Our example is a list of community centres in Toronto. You can download it from

http://maps.library.utoronto.ca/datapub/helpsheets/communitycentres.xls. It has names of community centres and their addresses, one per row.

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1	CommunityCentres	Address	City	Province	PostalCode 🕇		
2	Ancaster Park	41 Ancaster Rd	Toronto	ON	M3K1S7		
3	Broadlands Park	19 Castlegrove Blvd	Toronto	ON	M3A1K9		
4	Maurice Cody	181 Cleveland St	Toronto	ON	M4S3C1		
5	St. Lawrence	230 The Esplanade	Toronto	ON	M5A4J6		
6	L'Amoreaux	2000 McNicoll Ave	Toronto	ON	M1V5E9		
7	Tam Heather	730 Military Trail	Toronto	ON	M1E4P7		
8	Scadding Court	707 Dundas St W	Toronto	ON	M5T2W6		
9	Fairmount Park	90 Bowmore Rd	Toronto	ON	M4L3J2		
10	John Innes	150 Sherbourne St	Toronto	ON	M5A2R6		
11					-		
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2. Open up Microsoft Access and create a new blank database by clicking on **Blank Database** in the right toolbar (you will be prompted to give it a new name and asked where to save the new database file (".mdb" file):



3. Import the Microsoft Excel spreadsheet into the newly created database by selecting **File->Get External Data->Import...**

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		Database Properties						NUM		



 You will be prompted for the spreadsheet file. Make sure to select "Microsoft Excel (*.xls)" for the Files of type to see your file in the list. Double click on your spreadsheet file to import it.

Import		? 🔀
Look <u>i</u> n:	🔁 Test 💽 🔶 - 😢 🚳 🗙 🖄 🎫 - To	oļs 🕶
History	Communitycentres.xls	
My Documents		
Desktop		
* Favorites		
	Ele anno I	
My Network		Import
Places	Files of type: Microsoft Excel (*.xls)	Cancel



5. The Import Spreadsheet Wizard will take you through the steps of importing. First make sure that the correct sheet is highlighted in the list above and that your data is appearing correctly in the sample data preview window below. If everything looks okay, click on the **Next** button.

🕮 Import Spreadsheet Wi	🗉 Import Spreadsheet Wizard 🛛 🔀					
Your spreadsheet file contains more than one worksheet or range. Which worksheet or range would you like?						
 Show <u>W</u>orksheets Show Named <u>R</u>anges 	Sheet1 Sheet2 Sheet3					
Sample data for worksheet 'Shee	et1'.					
1 CommunityCentres	Address	City	Provin 🔺			
2 Ancaster Park	41 Ancaster Rd	Toronto	on 📃			
3 Broadlands Park	19 Castlegrove Blvd	Toronto	ON			
4 Maurice Cody	181 Cleveland St	Toronto	ON			
5 St. Lawrence	230 The Esplanade	Toronto	ON			
6 L'Amoreaux	2000 McNicoll Ave	Toronto	on 🖌			
	Cancel < Back	Next >	<u>F</u> inish			



6. Put a checkmark next to "First Row Contains Column Headings" and click on the **Next** button:

🗉 Import Spreadsheet Wizard 🛛 🔀						
Microsoft Access can use your column headings as field names for your table. Does the first row specified contain column headings?						
First Row Contains Column H	eadings					
CommunityCentres	Address	City	Provir			
1 Ancaster Park	41 Ancaster Rd	Toronto	ON 🔺			
2 Broadlands Park	19 Castlegrove Blvd	Toronto	on 📃			
3 Maurice Cody	181 Cleveland St	Toronto	ON			
4 St. Lawrence	230 The Esplanade	Toronto	ON			
5 L'Amoreaux	2000 McNicoll Ave	Toronto	ON			
6 Tam Heather	730 Military Trail	Toronto	ON 🚽			
	Cancel < <u>B</u> ack <u>N</u>	lext >	Einish			



7. Continue working through the wizard by clicking on the Next button repeatedly. You should encounter three more screens, but the defaults can be used. On the fourth and final screen, you can name the table "CommunityCentres" by filling in the Import to Table field. Then click on the Finish button to complete the import:

🖽 Import Spreadshe	🗉 Import Spreadsheet Wizard 🛛 🛛 🔀				
	That's all the information the wizard needs to import your data.				
	Import to Table:				
	CommunityCentres				
1					
	F				
	1 would like a wizard to <u>a</u> nalyze my table after importing the data.				
	Display Help after the wizard is finished.				
		-			
	Cancel < <u>B</u> ack <u>N</u> ext > <u>Finish</u>	2			

8. Once the import has completed you can exit out of Microsoft Access.



9. Start up the GeoPinpoint program. Make sure that it is set up correctly by having a path entered for the Geo-reference Database. If this is not the case, click on the **Browse** button and browse to the correct directory. It should be something similar to "C:\data\GeoPinpoint\Georef". Place a checkmark next to "Save as Default" and click on the **Select** button:

😮 GeoPinpoint Suite				
File Tools Help				
	t.		Select Path	
Ple Geo-reference Databa Pleas	ase Enter Location for Ise: C:\data\GeoPinpoint\	Geo-reference Database Georef Browse	GeoPinpoint Georef Ab	
Define Geocoding Pa	th	<u>M</u> DB	Geo-reference Database Path	v
Table/SQL:		Select	t 🔽 Save as Default	Cancel
Data Sources	Input Specifications	Output Specifications	Geocode	

10. Click on the **Define Geocoding Path** button and make sure that there is a checkmark next to Geocoding Path. If you are asked if you want to select all geocoding targets under this Node, say "Yes." Click on the **OK** button to close the window:

🔗 Defining Geocoding Path	X
⊞ ⊡ Geocoding Path	



11. Click on the **MDB**... button next to the **Target Database** field to browse to your newly created database of addresses:

😌 GeoPinpoint Suite	,						
File Tools Help							
GeoPinpoint Windows*							
Ple	ase Enter Location for	Geo-reference Databas	e				
Geo-reference Database: C:\data\GeoPinpoint\Georef Browse							
Please	e Define Geocoding Pa	th and Select Target D	atabase				
Define Geocoding Pa	th						
Target Database:		<u>MDB</u>					
Table/SQL:							
Next > Exit Ø							
Data Sources	Input Specifications	Output Specifications	Geocode				



12. Select your database file and click on the **Open** button:

Open Target Da	tabase				? 🔀
Look in:	🗀 Test		•	+ 🗈 💣 🎟	.
My Recent Documents Desktop My Documents	Communitycent	res.mdb			
My Network Places	File name: Files of type:	communitycentres.mdb MS Access Files (*.mdb) Open as read-only		• •	Open Cancel

13. Choose the table name "CommunityCentres" in the database and click on the **Select** button:

😯 Pick A Table 🛛 🛛 🔀						
CommunityCentres						
1						
Select	Cancel					



14. You will be asked if you want to add missing columns x, y, Rcode, and Prescode. Click on the **Yes** button:



15. You should see the path to your database filled in next to **Target Database** and your table name listed next to **Table/SQL**. Click on the **Next** button to continue:

😌 GeoPinpoint Suite	,						
File Tools Help							
			smatt southions"				
Ple	ase Enter Location for	Geo-reference Databa	se				
Geo-reference Databa	Geo-reference Database: C:\data\GeoPinpoint\Georef Browse						
Pleas	e Define Geocoding Pa	th and Select Target [)atabase				
Define Geocoding Pa	th						
Target Database:	U:\STAFF\KS\Helpsh	neets\Test\c <u>M</u> DB	. <u>O</u> DBC				
Table/SQL: CommunityCentres							
Data Sources	Input Specifications	Output Specifications	Geocode				



16. GeoPinpoint's default is to use un-parsed addresses – keep this checked. In this screen, you need to give it information about your column headers and how they match up to the data that GeoPinpoint needs. For our example, we should select Address from the drop-down menu next to the Un-Parsed Address field. We should also select City for Municipality, Province for Province, and PostalCode for Postal Code. Once you have matched up fields, click on the Next button:

😔 GeoPinpoint Sui	te	
File Tools Help		
	Specify Address	Data Fields And Options
Un-Parsed Address:	Address 💌	Spinar. Solutions
Street Number:	<none></none>	🔽 Use Un-Parsed Address Field
Street Prefix:*	<none></none>	Parse out Prefix from Street Name
Street Name:	<none></none>	Use Street Prefix and Suffix Type
Street Type:	<none></none>	Use Street Pre-Direction
		Use Constant for Province:
		Use Intersection Delimiter:
Street Direction:	<none></none>	🔲 Lookup Municipality via Postal Code
Suite:*	<none></none>	Geocode to Street Alias
Municipality:	City 💌	General Relax/Address
Province:	Province	
Postal Code:	PostalCode 🗾 💌	Back Next
* Optional		Deset
Data Sources	Input Specifications	Output Specifications Geocode



17. The next screen is telling you that four fields will be added to your database table: x, y, Rcode, and Prescode. The longitude will be outputted to field x and the latitude will be outputted to field y. You can leave the defaults as is and click on the Next button:

SeoPinpoint Suite			
File Tools Help			
	Specify Output Fie	lds And Options	smatt ^{IV} Spatial Solutions*
Longitude: Latitude: Result Code: Precision Code:	x y	Output Options Overwrite Exis Offset from Centre Inset from Centre Geocode Options Interactive Ge	sting Coordinates eline (m): 10 line (m): 0 eocoding is Required
Data Sources	Input Specifications	Output Specifications	Geocode



18. Click on the **Start** button to start geocoding your addresses. A window will popup to say when it is done. Click on the **OK** button.

😌 GeoPinpoint Suite	9		
File Tools Help			
GeoPinpoir Windows* Press S	tart To Geocode Or Bac	ck To Change Paramete	ers operations*
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To Inter	section	0	
To Poin	s of Interest	0	
To Post	al Code	0	
To Segr	nent	0	
To FSA	Centroid	0	
Το Ρορι	ilated Place Names	0	
To Muni	cipal Centroid	0	
Previous	ly Geocoded	0	
Not Geo	coded	0	
Total Re	cords	0	
Percent	age Geocoded	0%	
			Back Start Start Stop Exit
Data Sources	Input Specifications	Output Specifications	Geocode



19. GeoPinpoint will provide you with a summary report of the geocoding process. It will prompt you for where to save it. Browse to where you want to save it, give it a name (if it does not have one already), and click on the **Save** button.

Generate Summ	nary Report				? 🗙
Save in:	🔁 Test		•	+ 🗈 💣 🎟+	
My Recent Documents Desktop My Documents					
schultzm on 193-177-4Y4H					
	File name:	CommunityCentres		_	Save
My Network Places	Save as type:	Report Files (*.rept)		•	Cancel



20. This window will give you a summary of how the process went. Click on the **Exit** button to close the program:

S GeoPinpoint Suite	2		
File Tools Help			
GeoPinpoir Windows* Press S	tart To Geocode Or Ba	ck To Change Paramete	ers southions*
- Results-		0	
To Addri To Inters	ess ection	9	
To Point	s of Interest	0	
To Posta	al Code	0	
To Segn	nent	0	
To FSA	Centroid	0	
To Popu	lated Place Names	0	
To Muni	cipal Centroid	0	
Previous	ly Geocoded	0	
Not Geo	coded	0	
Total Re	cords	9	
Percenta	age Geocoded	100%	
			Stop Exit
Data Sources	Input Specifications	Output Specifications	Geocode



21. To see how your file has changed, double click on your database file, and then double click on your table name to open up the table and view the data.



22. You should see four additional columns of data, including longitude (x) and latitude (y) columns:

	Aicrosoft Access - [CommunityCentres : Table]									
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	ID	CommunityCent	Address	City	Province	PostalCode	Х	у	Rcode	Prescode
		1 Ancaster Park	41 Ancaster Rd	Toronto	ON	M3K1S7	-79.465836444	43.7320327156	111060121	5
		2 Broadlands Parl	19 Castlegrove I	Toronto	ON	M3A1K9	-79.323516790	43.7450771869	111060121	5
		3 Maurice Cody	181 Cleveland S	Toronto	ON	M4S3C1	-79.378585571	43.7053414536	111010121	5
		4 St. Lawrence	230 The Esplan	Toronto	ON	M5A4J6	-79.365094855	43.6496117405	111010121	5
		5 L'Amoreaux	2000 McNicoll A	Toronto	ON	M1V5E9	-79.302117604	43.8121709493	111060121	5
		6 Tam Heather	730 Military Trai	Toronto	ON	M1E4P7	-79.20055292	43.7907236262	111060121	5
		7 Scadding Court	707 Dundas St	Toronto	ON	M5T2W6	-79.40511889	43.6521722144	111010121	5
		8 Fairmount Park	90 Bowmore Rd	Toronto	ON	M4L3J2	-79.314560373	43.6768684670	111010121	5
		9 John Innes	150 Sherbourne	Toronto	ON	M5A2R6	-79.370166429	43.6560125483	111010121	5
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D	atasheet View							*\\	NU	м //



23. To display these points on a map, we can use ArcMap. Close Microsoft Access and open up ArcMap. Using a blank map template, click on the **Add Data** icon:

🔍 Untitled - ArcMap - ArcInfo	
File Edit View Bookmarks Insert Selec	ection Geoprocessing Customize Windows Help
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Table Of Contents 4 ×	^
8: 📮 😔 📮 🗄	
<i> E</i> layers	
	~
Add new data to the map's	486.381 757.782 Unknown Units



24. Browse to and select the database file and click on the Add button;

Add Data	
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communityce	ntres.mdb
🖻 communityce	ntres.xls
Name:	communitycentres.mdb Add
Show of type:	Datasets and Layers Cancel

25. You will then be prompted to select the table you want to add. Select "CommunityCentres" and click on the **Add** button:

Add Data	
Look in:	🗊 communitycentres.mdb 🛛 💊 🏠 🏠 🕼 🗮 🕶 🖆 🚳
Communit	yCentres
Name:	CommunityCentres 0dd >
Channing (1997)	
Show of type	Datasets and Layers



26. Right click on "CommunityCentres" in the Table of Contents left sidebar and select **Display XY Data ...**

Q Untitled - ArcMap - ArcInfo	
File Edit View Bookmarks I	nsert Selection Geoprocessing Customize Windows Help
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	Joins and Relates
×	Remove
	Data 🕨
	Edit Features
A	Geocode Addresses
; #.	Display Route Events
*** X1	Display XY Data
K	Properties
Adds a new map layer base	446.498 577.821 Unknown Units



27. A window opens showing that the X field in ArcMap matches the x column in our database table and the Y field matches the y column; however, it also says that the Coordinate System is unknown. To correct this so that the map will display correctly, click on the **Edit...** button:

Display XY Dat	a 🥐 🔀
A table containing map as a layer	; X and Y coordinate data can be added to the
Choose a table fr	om the map or browse for another table:
CommunityC	entres 🔽 🖻
Specify the field	ds for the X, Y and Z coordinates:
X Field:	x
Y Field:	У
Z Field:	<none></none>
Coordinate Sys	tem of Input Coordinates
Unknown Coo	rdinate System
Show Detai	s Edit
🔽 Warn me if the	e resulting layer will have restricted functionality
	OK Cancel



28. Click on the **Select...** button:

Spatial Reference	e Properties	?	×
XY Coordinate Syst	em		
Name: Un	known		
Details:			
		^	
		~	
	C-1		
	Select a predefined coordinate system. Import a coordinate system and X/Y, Z and M		
Import	domains from an existing geodataset (e.g., feature dataset, feature class, raster).		
New -	Create a new coordinate system.		
Modify	Edit the properties of the currently selected coordinate system.		
Clear	Sets the coordinate system to Unknown.		
Save As	Save the coordinate system to a file.		
	OK Cancel A	pply	5



29. Browse to Geographic Coordinate Systems\North America\ and double click on NAD 1983.prj (what GeoPinpoint uses):

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30. Click on the **OK** button. Then click again on the **OK** button to complete the map display. You should now see points on your map, similar to this:





31. Finally, we need to export it as a shapefile to save the changes we made in ArcMap. Right click on "CommunityCentres Events" and select **Data-**>**Export Data...**

Q Untitled - ArcMap - ArcInfo						
File Edit View Bookmarks Inser	t Se	ection Geoprocessing Customize Wir	ndows	Help		
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		Open Attribute Table				
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		Visible Scale Range	•			
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		Selection	•			
		Label Features				
		Edit Features	•			
	B	Convert Labels to Annotation				
	80	Convert Features to Graphics				
		Convert Symbology to Representation				
		Data	• 5	Rej	pair Data Source	e
	\diamond	Save As Layer File	<	Exp	oort Data	_ <u>_</u>
	P	Create Layer Package		Exp	oort to CAD	0
	6	Properties		Ma	ke Permanent	~
< <u> </u>	3			Vie	w Item Descripti	ion
Save this layer's data as a shapefile or geo	datab	ase feature (-79. ፍ	🧿 Re	view/Rematch A	ddresses



32. Click on the folder to browse to where you want to save the shapefile and give the shapefile a name. Then click on the **OK** button:

Export Da	ita	? 🗙
Evert	All Fash was	4.4
Export:	Airreatures	×
Use the sa	me coordinate system as:	
💿 this lay	er's source data	
🔵 the dal	a frame	
the fea (only a	ture dataset you export the data into pplies if you export to a feature dataset in a geodatabase)	
Output fe	ature class:	
U:\STAP	F\KS\Helpsheets\Test\CommunityCentres.shp	R
		43
	OK Can	cel

33. You will be prompted to add the exported data as a layer, say **Yes**. Now you have a shapefile with points representing each address you had in your original Excel spreadsheet:





You have now geocoded addresses using GeoPinpoint and displayed them as points in ArcMap.

If you have any questions or comments, please contact us at gis.maps@utoronto.ca.

U:\staff\docs\Help Sheets and Workshops\Geocoding Tutorial using GeoPinpoint Suite.doc

http://maps.library.utoronto.ca/docs/GeocodingGeoPinpoint.pdf