Article

A web tool for generating user-interface interactive networks

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Abstract
In the present study, an online web tool (http://www.iaees.org/publications/software/netJa/netGen.htm) for generating user-interface interactive networks was presented. In the network, the user can mouse-press any of the nodes to drag the network, examine network topology, evaluate node centrality, etc. It can be freely used and run on popular web browsers as Chrome, etc.

Keywords web tool; online application; user-interface; interactive networks; drawing.

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1 Introduction

Network construction mainly comprises two parts, the determination of connection structure, and the graphic drawing of the network (Zhang, 2012b, 2016c, 2018). Many software have been developed to conduct network construction.

Pajek is a software platform for the network analysis of the large and complex networks with up to millions of nodes. It is a fast visualized tool for program operation. Pajek contains various methods/algorithms on analysis of topological properties (Kuang and Zhang, 2011; Huang and Zhang, 2012; Li and Zhang, 2013; Jiang and Zhang, 2015a, b; Jiang et al., 2015; Xin and Zhang, 2020; Zhang and Zhang, 2019).

NetLogo is a multi-agent programmable modeling environment, which provides frameworks of computer codes of models / algorithms, and suggestions for extending these models / algorithms. It provides an alternative platform for self-organization modeling (Zhang, 2016c, 2018).

GKIN is a simulator and a comprehensive graphical interface where one can draw the model specification of reactions between hypothesized molecular participants in a gene regulatory and biochemical reaction network (Arnold et al., 2012). Its graphical user interface is written in Java which can run as a standalone or WebStart application. The drawing capability for rendering a network significantly enhances the ease of use of other reaction network simulators as KINSOLVER and enforces a correct semantic specification of the network (Zhang, 2016c, 2018).

NetDraw is a program for drawing social networks (Borgatti, 2011). NetDraw can read 2-mode data and automatically create a bipartite representation of it. Using the VNA file format (the VNA data format allows the user to store not only network data but also attributes of the nodes, along with information about how to display them like color, size, etc.). The program can save a network along with its spatial configuration, node colors, shapes, etc (Zhang, 2012b, 2016c, 2018).

netGenerator is used to draw directed, undirected, cyclic and acyclic network graphs, which is developed based on JDK 1.1.8, in which several classes are included (Zhang, 2012b). It can be freely downloaded and run on Windows platforms.

Cytoscape is an open source software platform for visualizing complex networks and integrating them with attribute data. A lot of Apps are available for various kinds of problem domains, including bioinformatics, social network analysis, and semantic web (Zhang, 2012b, 2016c, 2018).

In the past years, we have made some achievements in network construction and concerned areas (Zhang, 2007, 2011, 2012a-c, 2021; Liu and Zhang, 2011; Zhang et al., 2014; Zhang and Qi, 2020).

So far, there are few software and tools for generating interactive networks (R, 2019). In the present study, an online web tool for generating user-interface interactive networks is presented. It can be freely used and run on popular web browsers as Chrome, etc.

2 Web Codes and Demonstration

The online tool (http://www.iaees.org/publications/software/netJa/netGen.htm) is developed to run on Javascript enabled web browsers (Chrome, Sogou, 360, etc.). The required user-interface interactive network will be generated in the webpage based on the user's settings of network conformation. The web codes of netGen Version 1.0 are as follows:

```
<!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0 Transitional//EN"
"http://www.w3.org/TR/xhtml1/DTD/xhtml1-transitional.dtd">
<html xmlns="http://www.w3.org/1999/xhtml">
<head>
<meta charset="utf-8" />
<title>Web Tool for Generating User-Interface Interactive Networks</title>
<script type="text/javascript">
<!--
function netPage() {
netWin=window.open();
netWin.document.write("<html>");
netWin.document.write("<head>");
netWin.document.write("<meta charset=\"utf-9\">");
netWin.document.write("<title>User-Interface Interactive Network</title>");
netWin.document.write("<script type=\"text/javascript\" src=\"http://www.iaees.org/publications/software/netJa/netJsrc1.js\">");
netWin.document.write("</script>");
netWin.document.write("<script type=\"text/javascript\" src=\"http://www.iaees.org/publications/software/netJa/netJsrc2.js\">");
netWin.document.write("</script>");
netWin.document.write("<script type=\"text/javascript\" src=\"http://www.iaees.org/publications/software/netJa/netJsrc3.js\">");
netWin.document.write("</script>");
netWin.document.write("</head>");
netWin.document.write("<body style=\"background-color:white;\">");
```

```
netWin.document.write("<div id=\"htmlwidget_container\">");
netWin.document.write("<div id=\"htmlwidget-50742ce3f4548458b168\" style=\"width:960px;height:500px;\"
class=\"forceNetwork html-widget\"></div>");
netWin.document.write("</div>");
netWin.document.write("<font face=\"Times New Roman\" size=3>");
netWin.document.write("<script type=\"application/json\" data-for=\"htmlwidget-50742ce3f4548458b168\">");
netWin.document.write("{\"x\":");
netWin.document.write("{\"links\":");
netWin.document.write("{\"source\":["+(parent.document.netform.source.value).replace(/\n/g,"")+"],");
netWin.document.write("\"target\":["+(parent.document.netform.target.value).replace(/\n/g,"")+"],");
netWin.document.write("\"value\":["+(parent.document.netform.value.value).replace(/\n/g,"")+"],");
netWin.document.write("\"colour\":[\"#"+((parent.document.netform.colour.value).replace(/,/g,"\",\"#")).replace(/\n/g,"")+"\"]");
netWin.document.write("},");
netWin.document.write("\"nodes\":");
netWin.document.write("{\"name\":[\""+((parent.document.netform.name.value).replace(/,/g,"\",\"")).replace(/\n/g,"")+"\"],");
netWin.document.write("\"group\":["+(parent.document.netform.group.value).replace(/\n/g,"")+"]");
netWin.document.write("},");
netWin.document.write("\"options\":{");
netWin.document.write("\"colourScale\":\"d3.scaleOrdinal(d3.schemeCategory20);\",");
netWin.document.write("\"NodeID\":\"name\",");
netWin.document.write("\"Group\":\"group\",");
netWin.document.write("\"arrows\":"+parent.document.netform.arrows.value+",");
netWin.document.write("\"fontSize\":"+parent.document.netform.fontSize.value+",");
netWin.document.write("\"fontFamily\":\""+parent.document.netform.fontFamily.value+"\",");
netWin.document.write("\"linkDistance\":"+parent.document.netform.linkDistance.value+",");
netWin.document.write("\"linkWidth\":\"function(d) { return Math.sqrt(d.value)}\""+",");
netWin.document.write("\"charge\":"+(-parent.document.netform.charge.value)+",");
netWin.document.write("\"opacity\":"+parent.document.netform.opacity.value+",");
netWin.document.write("\"opacityNoHover\":"+parent.document.netform.opacityNoHover.value+"}");
netWin.document.write("},");
netWin.document.write("\"evals\":[],");
netWin.document.write("\"jsHooks\":[]");
netWin.document.write("}");
netWin.document.write("</script>");
netWin.document.write("<script type=\"application/htmlwidget-sizing\" data-for=\"htmlwidget-50742ce3f4548458b168\">");
netWin.document.write("{\"viewer\":{\"width\":450,\"height\":350,\"padding\":10,\"fill\":true},");
netWin.document.write("\"browser\":{\"width\":960,\"height\":500,\"padding\":10,\"fill\":true}}");
netWin.document.write("</script>");
netWin.document.write("</font>");
netWin.document.write("</body>");
netWin.document.write("</html>");
netWin.document.close();
netWin.focus();
}
//-->
```

```
</script>
</head>
<body style="background-color:white;">
<font face="Times New Roman" size=3>
<form name="netform" onSubmit="netPage()">
<font size=4><b>Network Conformation</b></font><br>
Network type:
<input type="radio" name="arrows" value="1" checked>Directed network
<input type="radio" name="arrows" value="0">Undirected network
<br>
Network size: <input type="text" name="charge" value="30" size=5><br>
Link length: <input type="text" name="linkDistance" value="50" size=5><br>
Node name size: <input type="text" name="fontSize" value="15" size=5><br>
Node name font:
<input type="radio" name="fontFamily" value="Times New Roman" checked>Times New Roman
<input type="radio" name="fontFamily" value="Sans Serif">Sans Serif
<input type="radio" name="fontFamily" value="Arial">Arial
<br>
Interactive node name visiblity:
<input type="radio" name="opacityNoHover" value="1" checked>True
<input type="radio" name="opacityNoHover" value="0">False
<br>
Interactive opacity for links and node names (1, 2, 100, etc.): <input type="text" name="opacity" value="100" size=5><br><br>
<font size=4><b>Network Data</b></font><br>
Source node IDs of links (Replace demo data with your own data):<br>
<textarea name="source" rows=6 cols=100 style="overflow-x:scroll;overflow-y:scroll">
30,60,59,58,57,57,55,54,54,53,52,52,52,51,49,48,46,45,44,43,40,39,38,38,37,36,35,35,34,34,34,33,31,23,22,21,20,20,19,17,16,1
6,15,14,13,9,8,6,5,4,2,1,0,0,45,4,17,52,25,50,18,25,25,25,28,47,5,52,38,25,27,3,17,45,4,52,25,25,24,26,25,59</textarea>
<br>
Target node IDs of links (Replace demo data with your own data):<br>
<textarea name="target" rows=6 cols=100 style="overflow-x:scroll;overflow-y:scroll">
31,10,28,45,58,39,41,36,55,55,23,32,56,44,2,21,3,29,38,53,46,37,4,17,13,49,59,60,36,43,47,34,54,22,13,6,11,12,52,29,42,41,9,4
4,8,7,20,15,38,29,27,3,1,50,57,57,57,57,57,53,52,51,50,48,45,43,39,38,36,35,33,33,31,30,30,28,24,23,18,16,14,5</textarea>
<br>
Link widths (Replace demo data with your own data):<br>
<textarea name="value" rows=6 cols=100 style="overflow-x:scroll;overflow-y:scroll">
10,10,10,5,10,10,10,10,10,10,10,15,10,10,10,10,10,10,10,10,10,10,10,10,10,10,10,10,10,10,10,10,10,10,10,6,10,10,10,10,10,10,10,10,
10,10,10,10,10,10,10,10,10,10,10,10,10,10,10,10,10,10,10,10,10,10,10,10,10,10,10,10,10,10,10,18,10,10,10,10,10,10,10,10,10,10,10,10,10,10,10,10,10,10,10,10</tex
tarea>
<br>
Link colours (100-999; Replace demo data with your own data):<br>
<textarea name="colour" rows=6 cols=100 style="overflow-x:scroll;overflow-y:scroll">
666,312,666,666,666,666,666,666,666,666,666,666,666,666,666,666,666,666,666,666,666,108,666,666,666,666,666,666,666,666,666,666,666,666,666,666,666,666,66
6,666,666,573,666,666,666,666,666,666,666,666,666,666,666,666,666,666,666,666,666,432,666,666,666,666,666,666,666,666,666,666,666,666,666,666,666,666,235,666,666,
666,666,666,666,666,666,666,666,666,666,989,666,666,666,666,666,666,666,666,666,666,666,666,666,666,666,168,666,666</textarea>
```

```
<br>
Node names (Replace demo data with your own data):<br>
<textarea name="name" rows=6 cols=100 style="overflow-x:scroll;overflow-y:scroll">
ACDC,adipoR,Akt,AMPK,AP-1,ASK1,ATF4,Bax,Bid,Bim,C/EBP-alpha,CASP3,CASP7,CASP8,Cdc42,CHOP,ChREBP,c-Jun,
CxI/II/III/IV,CYP2E1,Cytc,elF2-alpha,Fas,FasL,Fatty Acyl-CoA,FFAs,Glucose,GSK-3,IKK-beta,IL1,IL6,IL6R,IL8,INS,
INSR,IRE1-alpha,IRS1/2,ITCH,JNK1,JNK1/2,LEP,Lipogenic enzymes,L-PK,LXR-alpha,MLK3,NF-kappaB,ObR,Oxysterol,
PERK,PI3K,PPAR-alpha,Rac1,ROS,RXR,SOCS3,SREBP-1c,TGF-beta1,TNF-alpha,TNFR1,TRAF2,XBP1</textarea>
<br>
Node group IDs (Replace demo data with your own data):<br>
<textarea name="group" rows=6 cols=100 style="overflow-x:scroll;overflow-y:scroll">
1,1,1,1,1,1,1,1,1,1,1,2,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,2,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,2,1,1,1,1,1,1</textarea>
<br>
<input type="submit" value="OK"><input type="button" value="Manual"
onClick="window.open('http://www.iaees.org/publications/journals/nb/articles/2021-11(4)/web-tool-for-generating-user-interfac
e-interactive-networks.pdf')">
</form>
</font>
</body>
</html>
```

In the web codes above, the Json codes, netJsrc1.js, netJsrc2.js, and netJsrc3.js, were compiled from networkD3 package in the free R software (R, 2019).

Using the demo data in Table 1 and default settings of network conformation, a user-interface interactive network was generated, as shown in Fig. 1 (user settings) and Fig. 2 (the user-interface interactive network). In the network, the user can mouse-press any of the nodes to drag the network, examine network topology, evaluate node centrality, etc (Zhang, 2012b, 2016c, 2018, 2021). The network with required conformation or appearance can be snapshot at any time by pressing the key “PrScrn” on the keyboard or using snapshot tools.

3 User’s Settings

3.1 Network conformation

(1) Network type. Choice of directed network or undirected network can be made according to the type of network data. For the directed network, however, the choice of undirected network can also be made to generate an undirected network.

(2) Network size. A greater value of network size means the larger dimension of the network. Too greater values will make the network fall out the scope of web browser; however, the details of local topological structure of the network can be easily examined.

(3) Link length. The value denotes the length of each link in the network.

(3) Node name size. It denotes the size of node name beside the node.

(4) Node name font. The user can choose the required font style of node names.

(5) Interactive node name visibility. No node names appear if there is no mouse-pointing on nodes. However, only the name of the mouse-pointed node will appear.

(6) Interactive opacity for links and node names. The value determines that if the mouse-pointed node or (and) link and their adjacent nodes or (and) links are highlighted and the others in the network are weakly displayed.

3.2 Network data

There are six text areas for receiving different data:

(1) Source and target node IDs of links. Delete the demo data in the two text areas and enter (copy to) the user's data. The sequence of source and target node IDs for a link in the two text areas should be the same. Check demo data in Table 1 and Fig. 1 for details. If the network is an undirected one, anyone of the two nodes in a link can be placed in either source or target text areas.

(2) Link widths. The width of each link in the network. It can be used to set the highlighted links, paths, circuits, loops, trees, etc., and to set the weight and flux of each link (Zhang, 2012b, 2016a-b, 2017a-b, 2016c, 2018, 2021).

(3) Link colours. The colour of each link in the network. It can be used to set the highlighted links, paths, circuits, loops, trees, etc (Zhang, 2012b, 2016a-b, 2017a-b, 2016c, 2018, 2021).

(4) Node names. Node names, with multiple languages.

(5) Node group IDs. The group (cluster) that a node belongs to. The nodes with the same IDs belong to the same group (cluster). It can be used to set the different node clusters, etc (Zhang, 2012b, 2016c-d, 2018, 2021). All 1's if no categorical difference among nodes.

It should be noted that a node name should not contain comma, or else the comma inside the node name should be replaced with other symbols.

Table 1 Demo data (Metabolic pathway of non-alcoholic fatty liver disease) used in the web software (Zhang and Feng, 2017).

Source node ID	Target node ID	Link width	Link color	Node ID	Node name	Node group
30	31	10	666	0	ACDC	1
60	10	10	312	1	adipoR	1
59	28	10	666	2	Akt	1
58	45	5	666	3	AMPK	1
57	58	10	666	4	AP-1	1
57	39	10	666	5	ASK1	1
55	41	10	666	6	ATF4	1
54	36	10	666	7	Bax	1
54	55	10	666	8	Bid	1
53	55	10	666	9	Bim	1
52	23	10	666	10	C/EBP-alpha	1
52	32	15	666	11	CASP3	2
52	56	10	666	12	CASP7	1
51	44	10	666	13	CASP8	1
49	2	10	666	14	Cdc42	1
48	21	10	666	15	CHOP	1
46	3	10	108	16	ChREBP	1
45	29	10	666	17	c-Jun	1
44	38	10	666	18	CxI/II/III/IV	1
43	53	10	666	19	CYP2E1	1
40	46	10	666	20	Cytc	1
39	37	10	666	21	eIF2-alpha	1
38	4	10	666	22	Fas	1
38	17	10	666	23	FasL	1
37	13	10	666	24	Fatty Acyl-CoA	1
36	49	10	666	25	FFAs	1
35	59	10	666	26	Glucose	1
35	60	10	666	27	GSK-3	1
34	36	10	666	28	IKK-beta	1

34	43	10	666	29	IL1	1
34	47	10	666	30	IL6	1
33	34	10	666	31	IL6R	2
31	54	6	573	32	IL8	1
23	22	10	666	33	INS	1
22	13	10	666	34	INSR	1
21	6	10	666	35	IRE1-alpha	1
20	11	10	666	36	IRS1/2	1
20	12	10	666	37	ITCH	1
19	52	10	666	38	JNK1	1
17	29	10	666	39	JNK1/2	1
16	42	10	666	40	LEP	1
16	41	10	666	41	Lipogenic enzymes	1
15	9	10	666	42	L-PK	1
14	44	10	666	43	LXR-alpha	1
13	8	10	666	44	MLK3	1
9	7	10	432	45	NF-kappaB	1
8	20	10	666	46	ObR	1
6	15	10	666	47	Oxysterol	1
5	38	10	666	48	PERK	1
4	29	10	666	49	PI3K	1
2	27	10	666	50	PPAR-alpha	1
1	3	10	666	51	Rac1	1
0	1	10	666	52	ROS	1
0	50	10	666	53	RXR	1
45	57	10	666	54	SOCS3	2
4	57	10	666	55	SREBP-1c	1
17	57	10	235	56	TGF-beta1	1
52	57	10	666	57	TNF-alpha	1
25	57	10	666	58	TNFR1	1
50	53	10	666	59	TRAF2	1
18	52	10	666	60	XBP1	1
25	51	10	666			
25	50	10	666			
25	48	10	666			
28	45	10	666			
47	43	18	666			
5	39	10	666			
52	38	10	989			
38	36	10	666			
25	35	10	666			
27	33	10	666			
3	33	10	666			
17	31	10	666			
45	30	10	666			
4	30	10	666			
52	28	10	666			
25	24	10	666			
25	23	10	666			
24	18	10	666			
26	16	10	168			
25	14	10	666			
59	5	10	666			

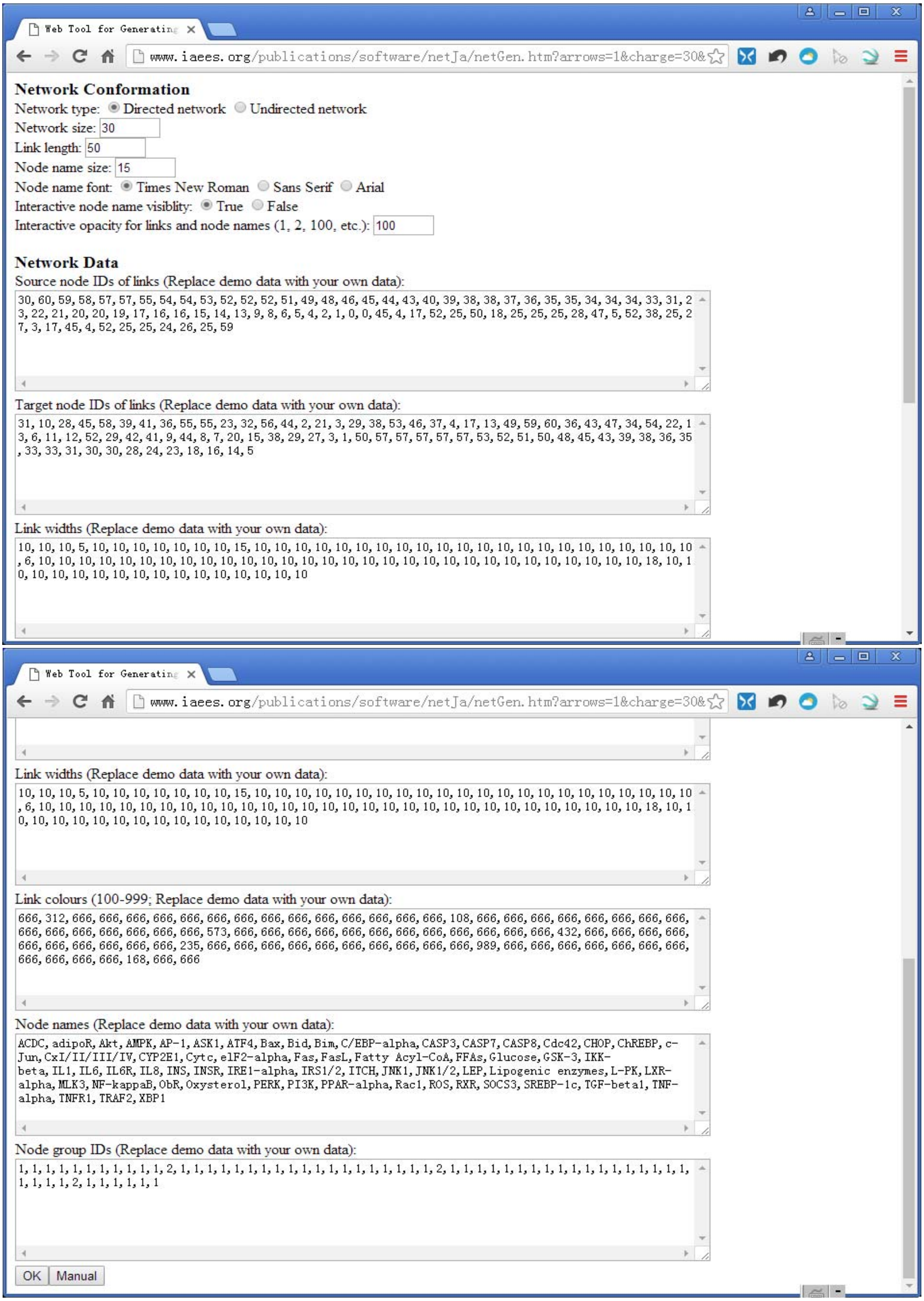


Fig. 1 Web interface for setting the network conformation.

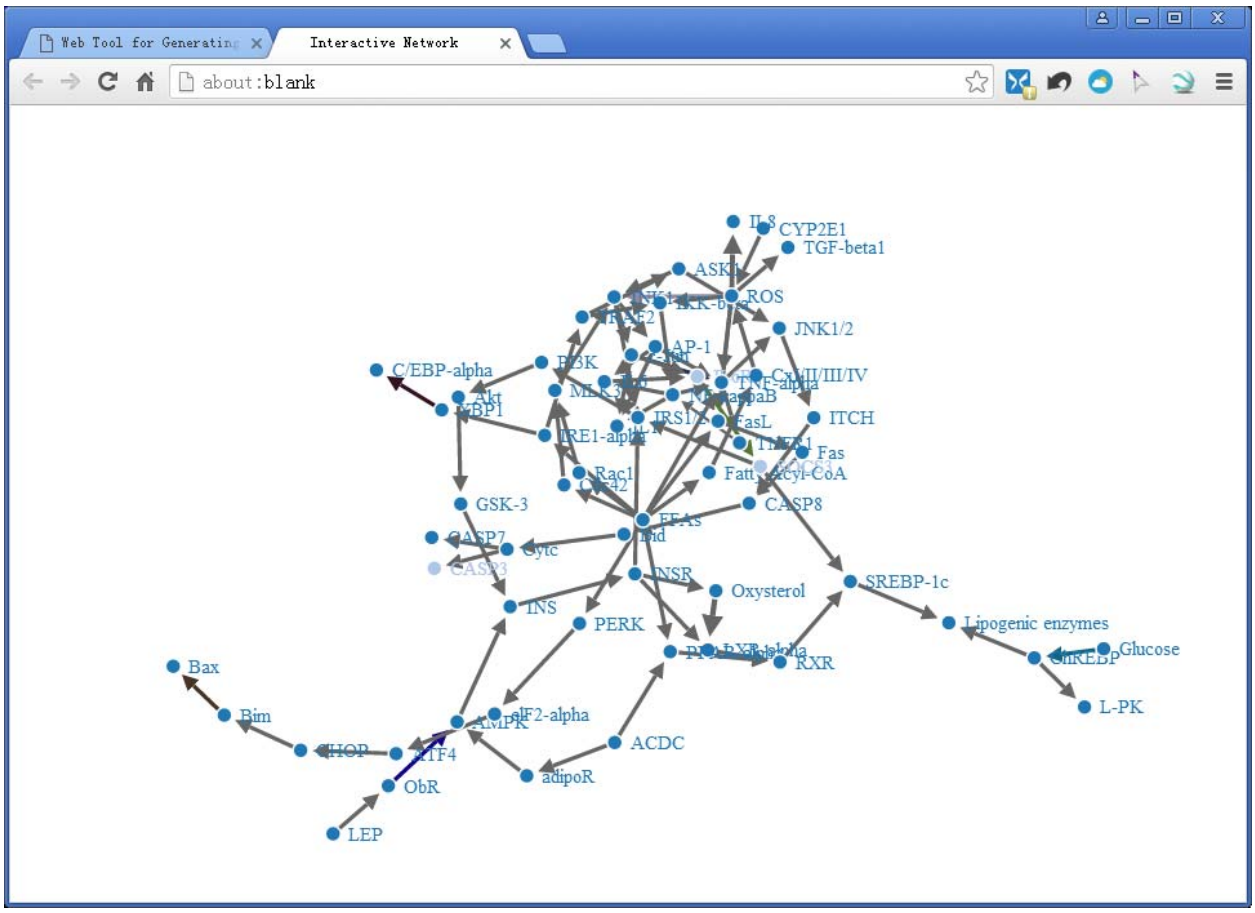


Fig. 2 The required user-interface interactive network.

4 Saving The User-Interface Interactive Network as An HTML File

In order to save the user-interface interactive network as an html file for future use, the following procedures can be implemented:

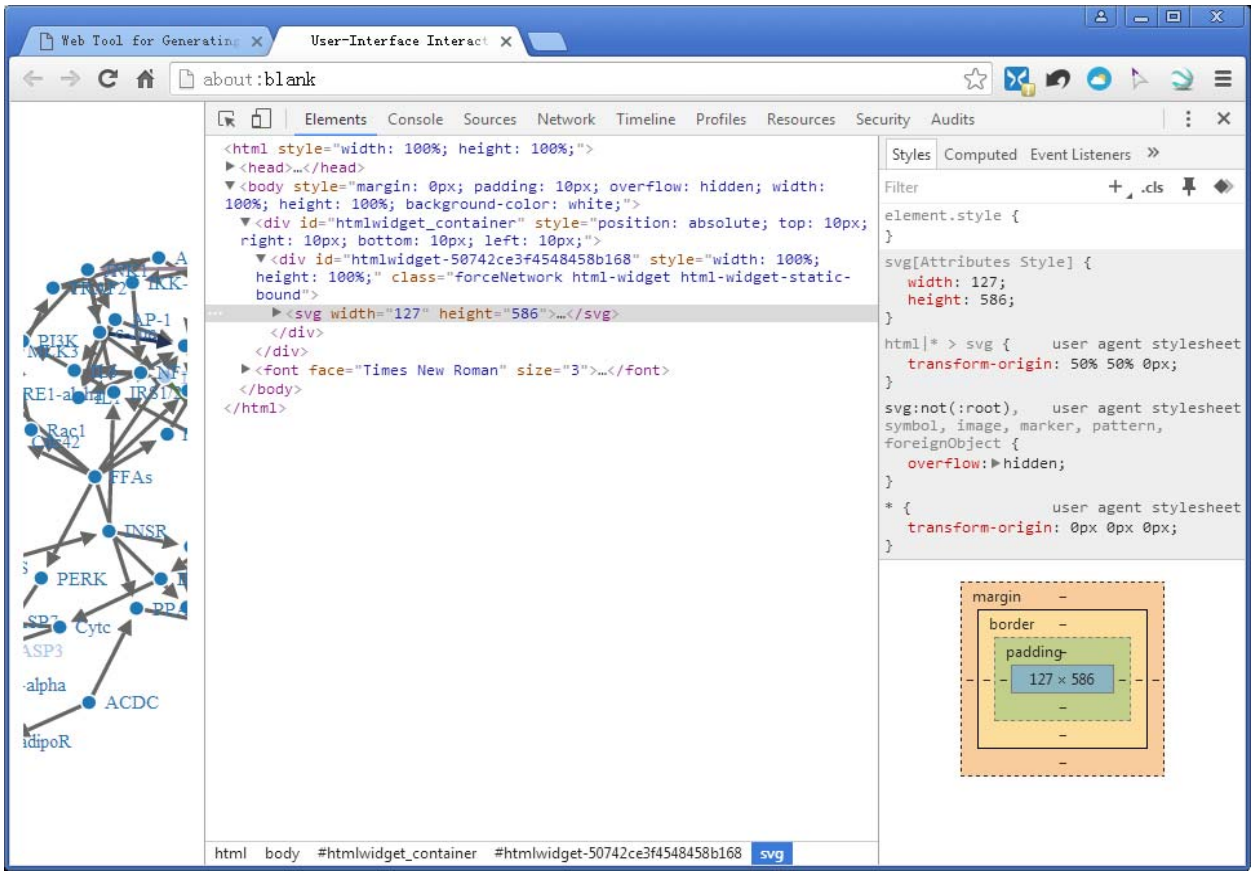
(1) When the web page of user-interface interactive network (Fig. 2) is the focus, press the key F12 on the keyboard, and the web code page will appear (Fig. 3a).

(2) Click the code line " <svg width…</svg>, and press the right mouse to "Delete element" (Fig. 3b).

(3) Click the code line "<html style=…", and press the right mouse to "Edit as HTML" (Fig. 3c), and the HTML codes will appear in a window (Fig. 3d).

(4) Press Ctrl+C to copy the HTML codes in the window and paste them into the word editor or notepad (Fig. 3e-f). In the word editor or notepad page, find and delete the "html-widget-static-bound" (Fig. 3e), and finally save the page as an HTML file with the file extension ".htm" (Fig. 3f).

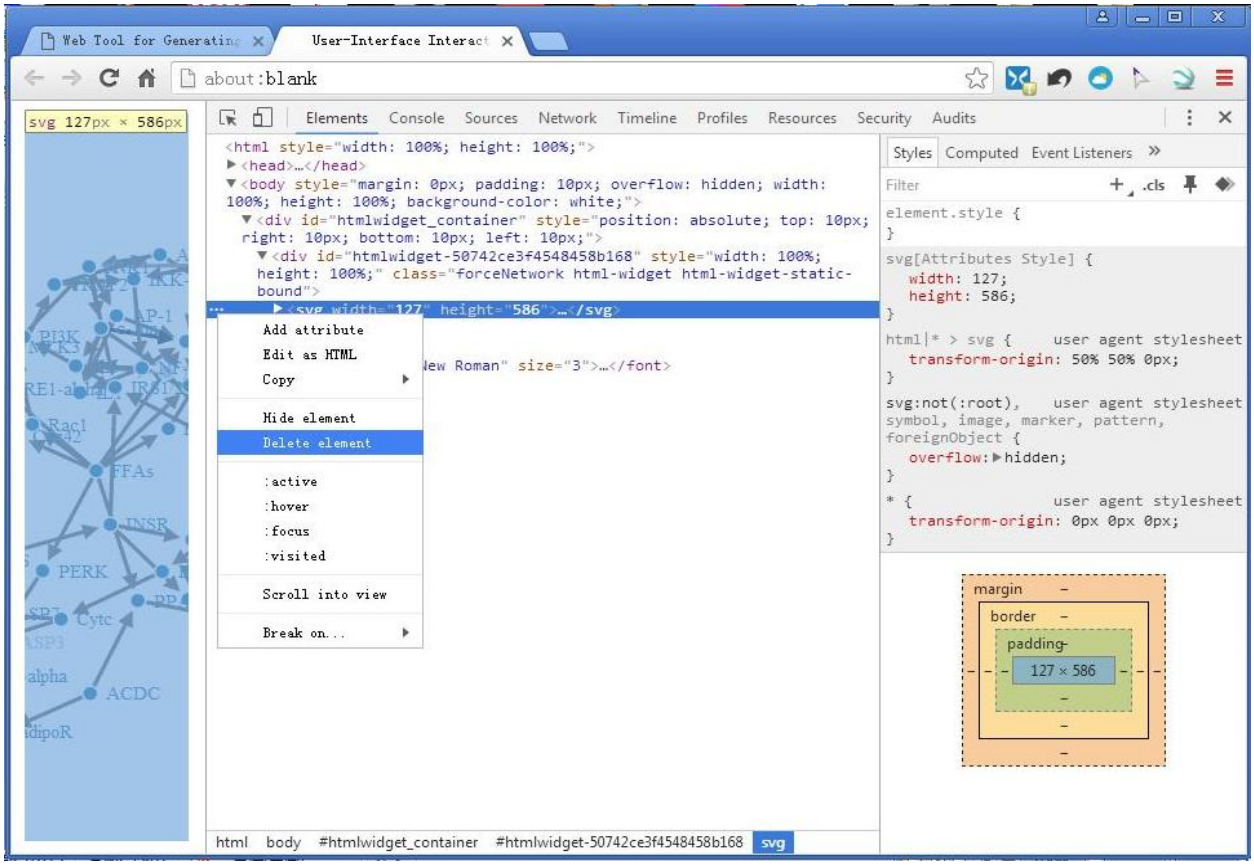
By doing so, an HTML file for the user-interface interactive network is saved.


Web Tool for Generating
User-Interface Interact
about:blank
Elements Console Sources Network Timeline Profiles Resources Security Audits
<html style="width: 100%; height: 100%;">
<head>…</head>
<body style="margin: 0px; padding: 10px; overflow: hidden; width: 100%; height: 100%; background-color: white;">

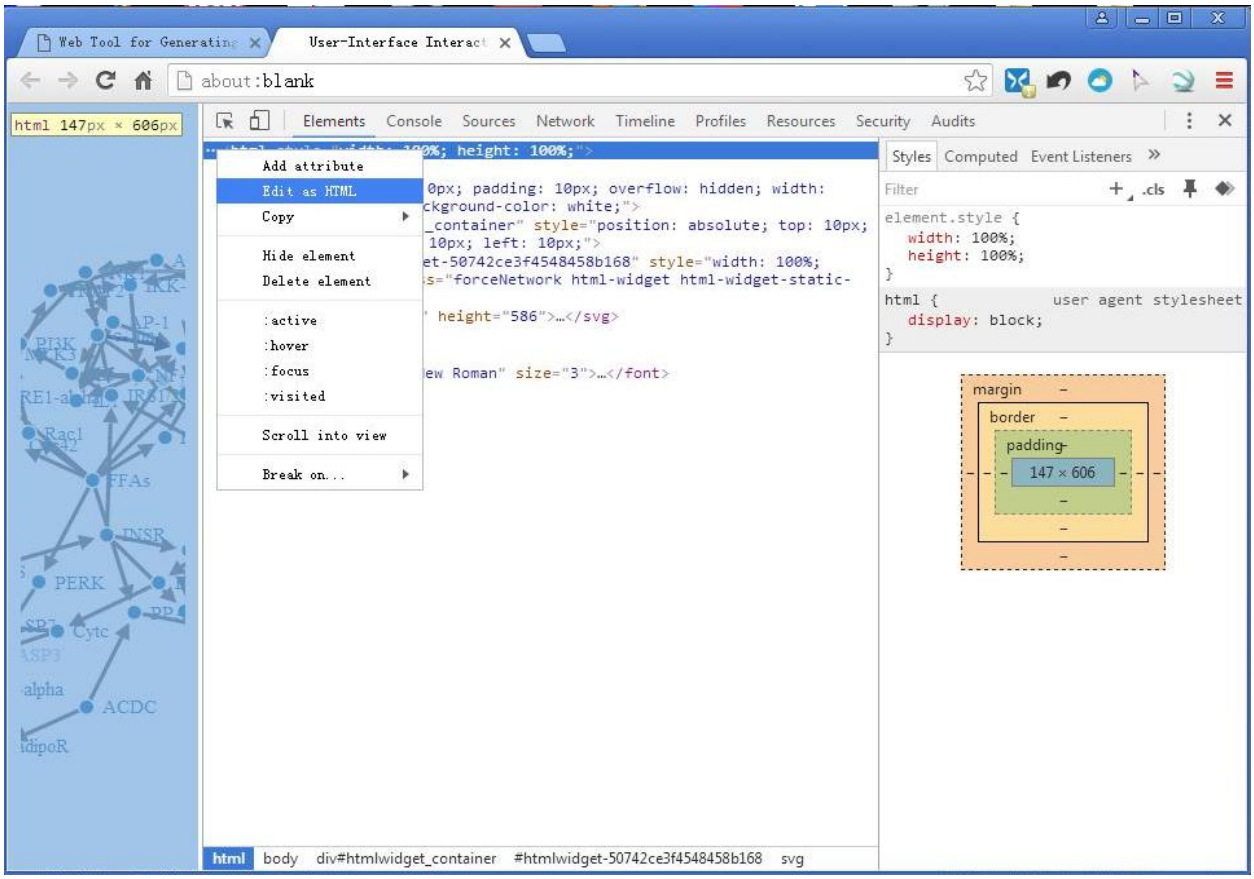
<svg width="127" height="586">…</svg>

…
</body>
</html>
Styles Computed Event Listeners
Filter .cls
element.style {
}
svg[Attributes Style] {
width: 127;
height: 586;
}
html|* > svg { user agent stylesheet
transform-origin: 50% 50% 0px;
}
svg:not(:root), user agent stylesheet
symbol, image, marker, pattern, foreignObject {
overflow: hidden;
}
* { user agent stylesheet
transform-origin: 0px 0px 0px;
}
margin
border
padding
127 × 586
html body #htmlwidget_container #htmlwidget-50742ce3f4548458b168 svg
PERK
Cytc
ACDC
FFAs
INSR

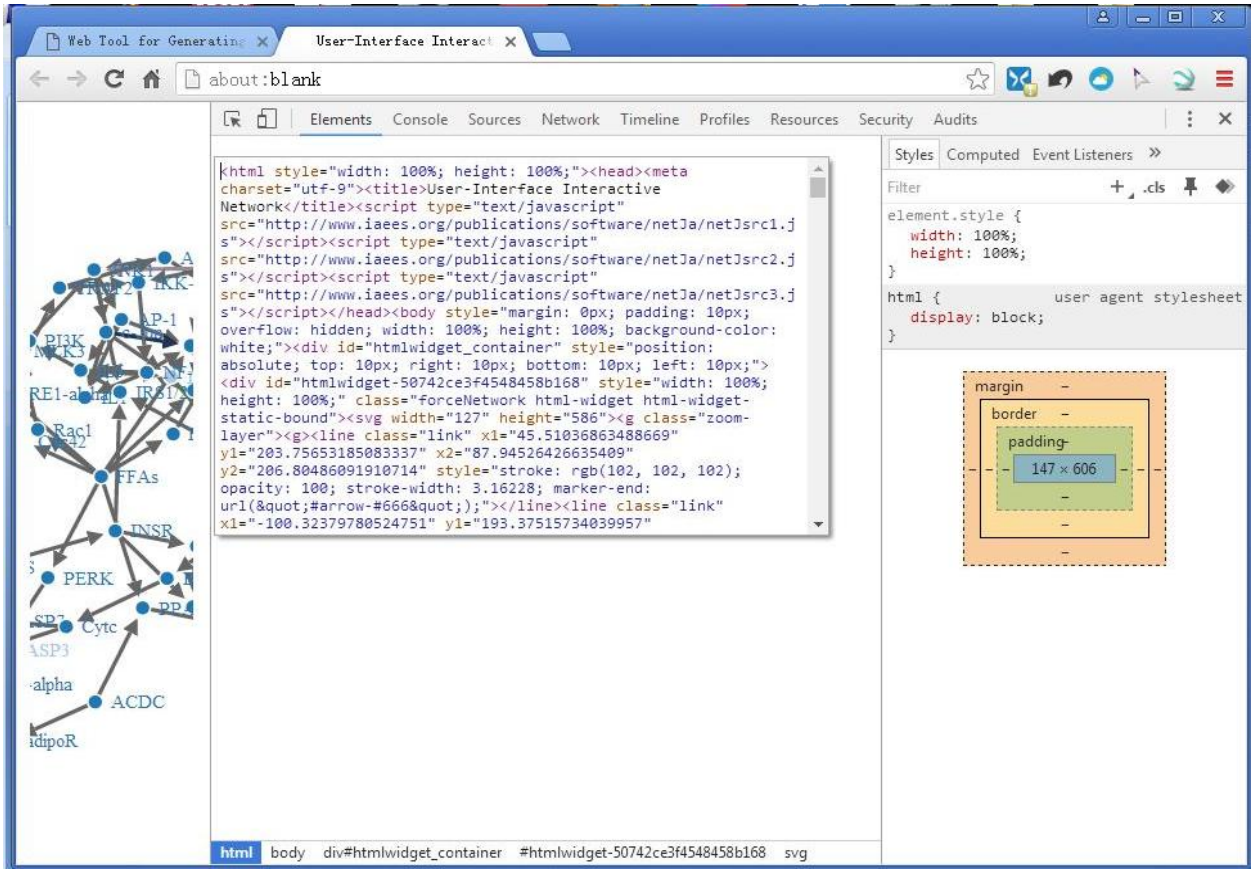
(a)


Web Tool for Generating
User-Interface Interact
about:blank
svg 127px × 586px
Elements Console Sources Network Timeline Profiles Resources Security Audits
Add attribute
Edit as HTML
Copy
Hide element
Delete element
:active
:hover
:focus
:visited
Scroll into view
Break on...
Styles Computed Event Listeners
margin
border
padding
127 × 586
html body #htmlwidget_container #htmlwidget-50742ce3f4548458b168 svg
PERK
Cytc
ACDC
FFAs
INSR

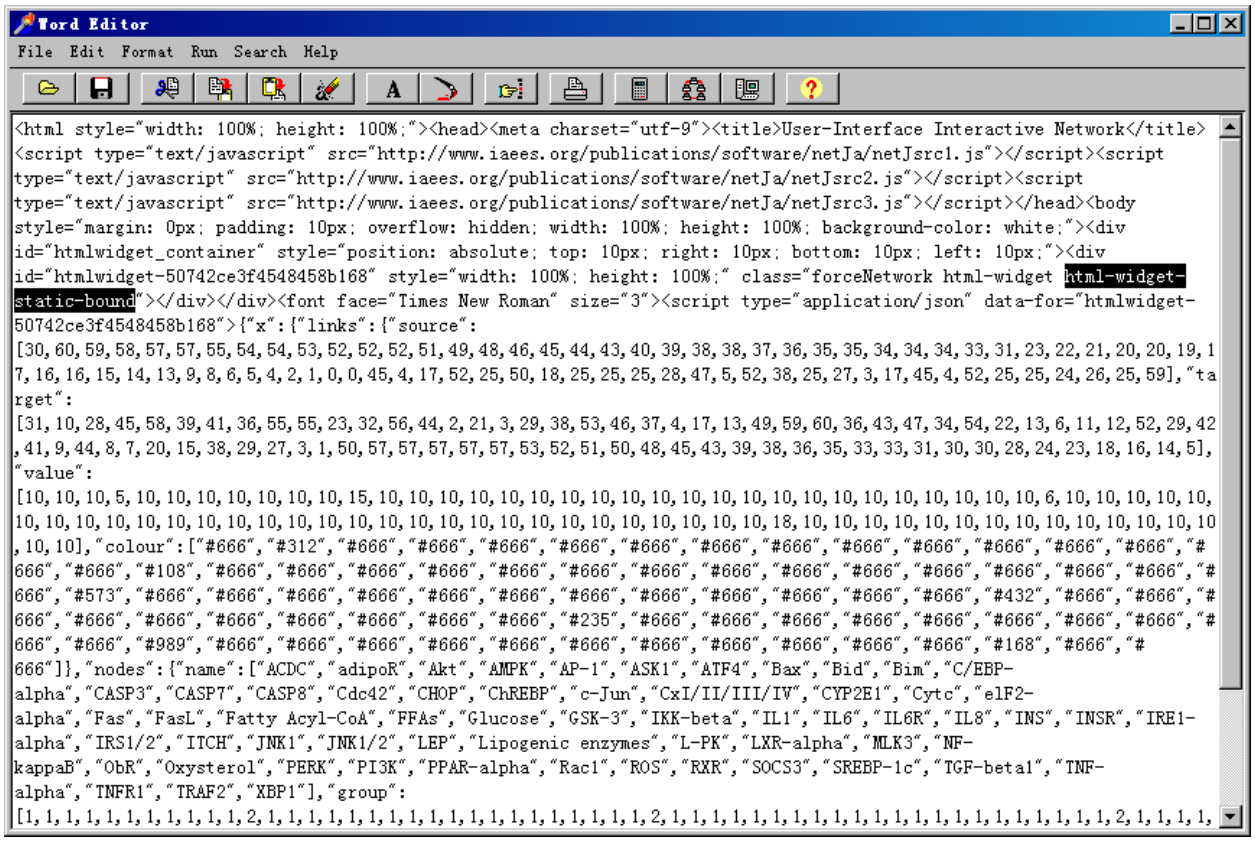
(b)


Web Tool for Generating
User-Interface Interact
about:blank
html 147px × 606px
Elements Console Sources Network Timeline Profiles Resources Security Audits
Add attribute
Edit as HTML
Copy
Hide element
Delete element
:active
:hover
:focus
:visited
Scroll into view
Break on...
Styles Computed Event Listeners
element.style {
width: 100%;
height: 100%;
}
html { user agent stylesheet
display: block;
}
margin
border
padding
147 × 606
html body div#htmlwidget_container #htmlwidget-50742ce3f4548458b168 svg

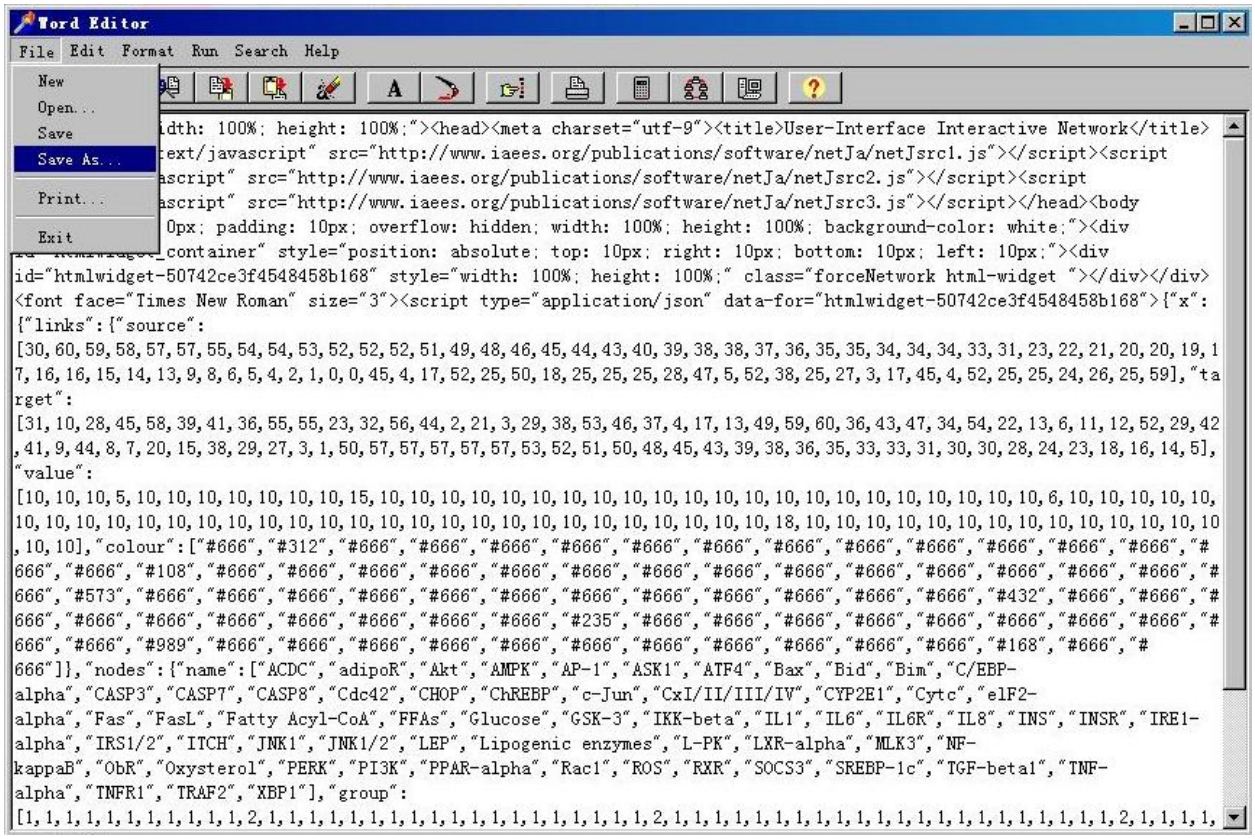
(c)


Web Tool for Generating
User-Interface Interact
about:blank
Elements Console Sources Network Timeline Profiles Resources Security Audits
Styles Computed Event Listeners
element.style {
width: 100%;
height: 100%;
}
html { user agent stylesheet
display: block;
}
margin
border
padding
147 × 606
html body div#htmlwidget_container #htmlwidget-50742ce3f4548458b168 svg

(d)



(e)



(f)

Fig. 3 The procedures for saving the user-interface interactive network as an HTML file.

5 Transform EXCEL Network Data to Comma Separated Text Network Data Used in Users' Settings

Suppose the network data are stored in Sheet 1 of Excel, as formatted in Table 1 (do not include title row). The following procedures are available (Fig. 4a-c):

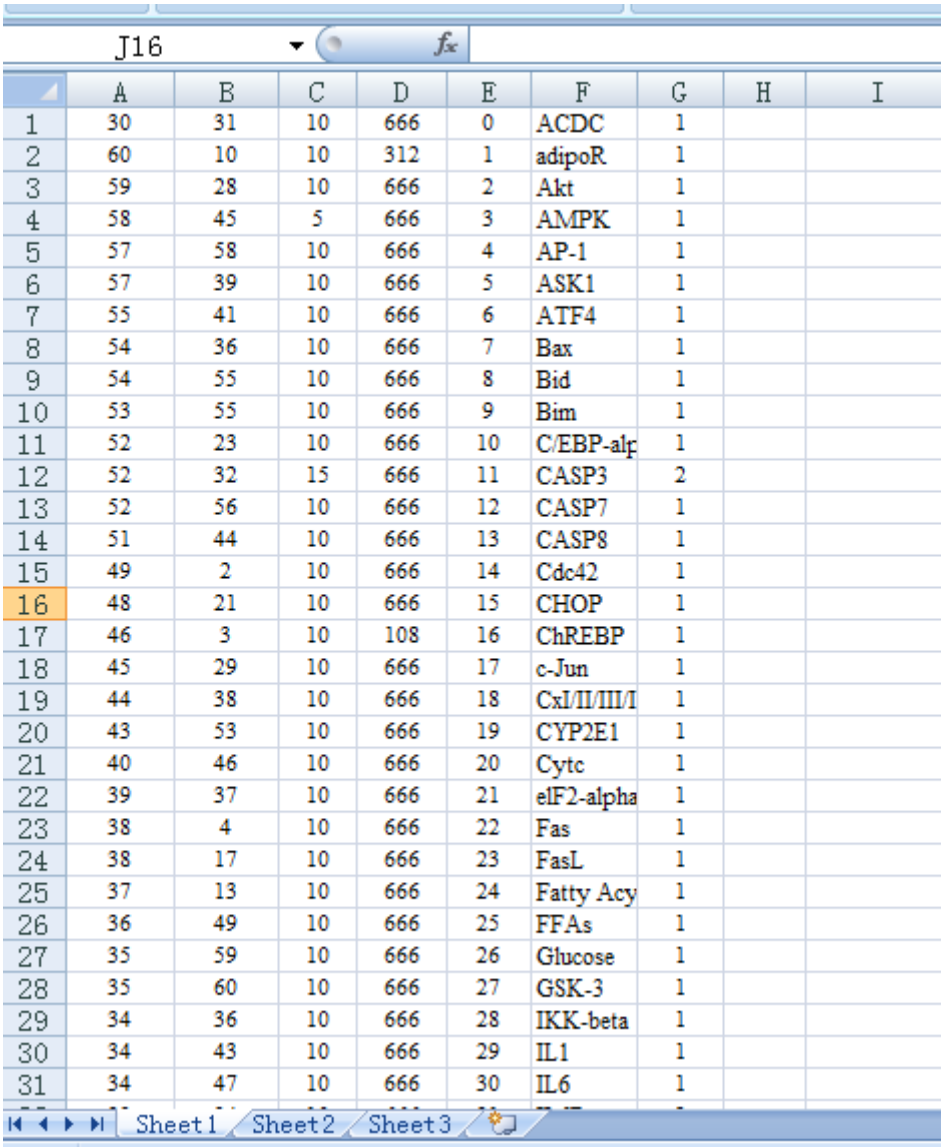
(1) In Sheet 1, put mouse in an arbitrary cell of the data area, and press Ctrl+Shift+8 to select the data area, and finally press Ctrl+C to copy the selected data.

(2) In Sheet 2, press Ctrl+A to select all sheet area, and thereafter press Ctrl+Alt+V to paste specially. A window "Paste Special" appears, and select "Transpose", click the button OK. The transposed data were thus pasted (Fig. 4b).

(3) Save the data in Sheet 2 to a (comma separated) CSV file.

(4) In word editor or notepad, open the CSV file, and delete redundant comma beyond data area (Fig. 4c). The data are thus prepared for use.

By doing so, the user can paste required data into separate text areas in the web tool.



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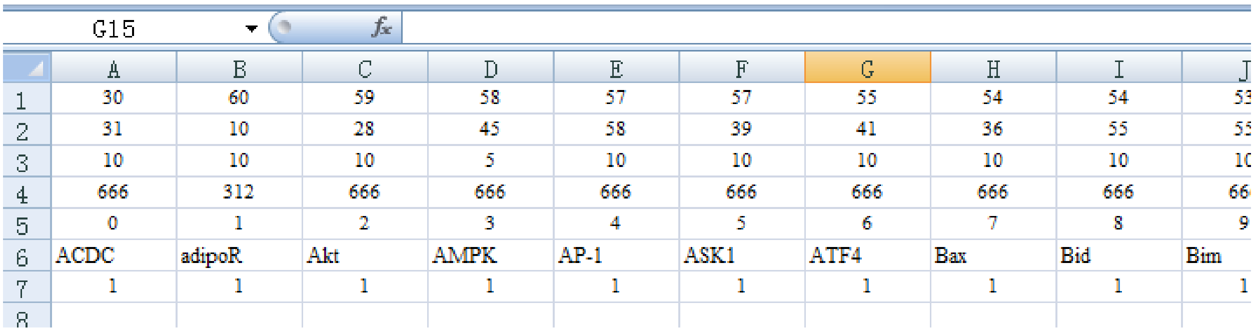
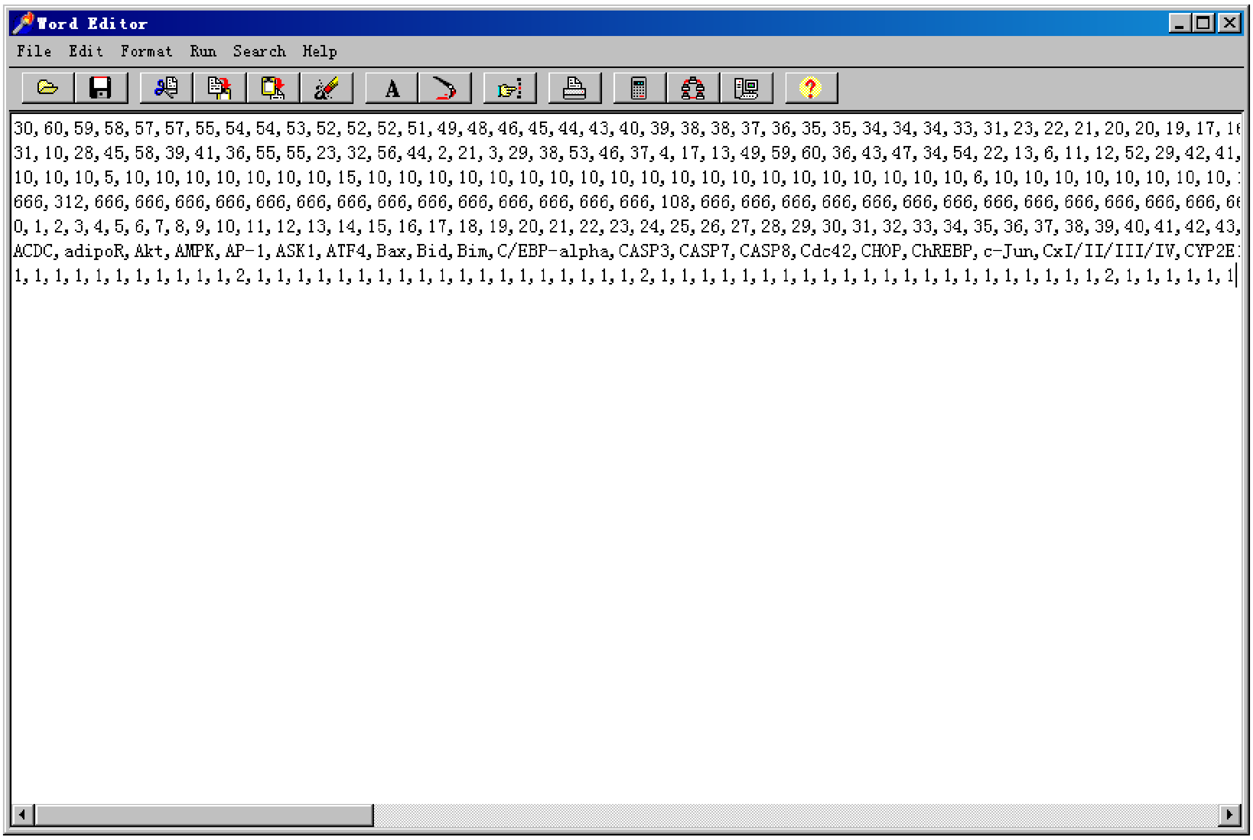
	A	B	C	D	E	F	G	H	I
1	30	31	10	666	0	ACDC	1		
2	60	10	10	312	1	adipoR	1		
3	59	28	10	666	2	Akt	1		
4	58	45	5	666	3	AMPK	1		
5	57	58	10	666	4	AP-1	1		
6	57	39	10	666	5	ASK1	1		
7	55	41	10	666	6	ATF4	1		
8	54	36	10	666	7	Bax	1		
9	54	55	10	666	8	Bid	1		
10	53	55	10	666	9	Bim	1		
11	52	23	10	666	10	C/EBP-alp	1		
12	52	32	15	666	11	CASP3	2		
13	52	56	10	666	12	CASP7	1		
14	51	44	10	666	13	CASP8	1		
15	49	2	10	666	14	Cdc42	1		
16	48	21	10	666	15	CHOP	1		
17	46	3	10	108	16	ChREBP	1		
18	45	29	10	666	17	c-Jun	1		
19	44	38	10	666	18	CxI/II/III/I	1		
20	43	53	10	666	19	CYP2E1	1		
21	40	46	10	666	20	Cytc	1		
22	39	37	10	666	21	eIF2-alpha	1		
23	38	4	10	666	22	Fas	1		
24	38	17	10	666	23	FasL	1		
25	37	13	10	666	24	Fatty Acy	1		
26	36	49	10	666	25	FFAs	1		
27	35	59	10	666	26	Glucose	1		
28	35	60	10	666	27	GSK-3	1		
29	34	36	10	666	28	IKK-beta	1		
30	34	43	10	666	29	IL1	1		
31	34	47	10	666	30	IL6	1		

Sheet1 Sheet2 Sheet3

(a)



(b)



(c)

Fig. 4 Some of the procedures for transform EXCEL network data to text network data used in users' settings.

6 Discussion

The present online tool, netGen is the first version, i.e., netGen Version 1.0. In the future the higher versions with more or improved functionalities and with more applicable web browsers may be presented. Users are suggested for checking possible updates occasionally.

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