1. Tag-cloud formula

Every scholar has one or more keywords associated, because when he/she signed up into csregistry.org, he/she had to define his own keywords.
When we process all the scholars information, we can establish relations between scholars and keywords and say also, that every keyword has one or more scholars associated.
Then, the keyword's weight is defined by the number of scholars using that keyword.

$$f(w) = \text{font}_{\min} + (w-1) * \frac{\text{font}_{\max} - \text{font}_{\min}}{\text{maxWkey} - \text{minWkey}}$$

$$\begin{aligned}
\text{font}_{\min} &: \text{The minimum size font. It's predefined by the programmer} && (1)\\
\text{font}_{\max} &: \text{The maximum size font. It's predefined by the programmer} && (2)\\
minWkey &: \text{The keyword with the minimum weight among the n-keywords} && (3)\\
maxWkey &: \text{The keyword with the maximum weight among the n-keywords} && (4)\\
w &: \text{The weight of the i-keyword} && (5)
\end{aligned}$$

Both minWkey and maxWkey are calculated before entering in the cicle. In particular case of explorerjs, the minWkey will be always 1, because a keyword exists if at least one scholar has used it. In other case, the keyword wouldn't exist.

2. Demonstration

To explain how to reach the formula, let's take a real example.
The user has selected 3 scholars ("Jasmin Kominek", "Adam Dunn", "Paul Bourgine") from the network "Carla Taramasco", thus we have the following keywords and weights:

Keyword	Weight
social networks	3
mathematics	2
global change	1
security	1
path dependency	1
behavior	1
decision theory	1
modeling	1
social dynamics	1
statistical physics	1
intervention	1
simulation	1
strategy	1
multi level	1
cellular automata	1
collaboration networks	1
citation networks	1
landscape ecology	1
climate change	1
health informatics	1
diffusion processes	1
complex adaptive networks	1
coevolution	1
learning	1

If the web-programmer decides to set the font_{min}=12 and the font_{max}=20, then we have to decide the incremental size of the fonts for each weight.

Initially, we can establish for sure, this:

Weight	FontSize
1	12
2	?
3	20

The keyword with the minimum weight has the minimum font-size and the keyword with the maximum weight has the maximum font-size.
But, how can we calculate the font-size values of the weights located between the extreme weights? In this case, we can try by dividing fonts and weight to get the "incremental value", or more concisely,

$$\text{incremental value} = \frac{\Delta\text{fontsize}}{\Delta\text{weight}} = \frac{\text{font}_{\text{max}} - \text{font}_{\text{min}}}{\text{maxWkey} - \text{minWkey}} = \frac{20-12}{3-1} = 4$$

The sum between the minimum font-size and the incremental value ("4") is equals to "16". And if we sum this "16" and the incremental value ("4"), the result is "20" that is the same as the maximum font-size:

Weight	FontSize
1	12
2	16
3	20

Then:

Weight	Formula	FontSize
1	$12 + \frac{\Delta\text{fontsize}}{\Delta\text{weight}}$	12
2	$12 + \frac{\Delta\text{fontsize}}{\Delta\text{weight}}$	16
3	$12 + \frac{\Delta\text{fontsize}}{\Delta\text{weight}}$	20

In this case, we know that the incremental value $= \frac{\Delta\text{fontsize}}{\Delta\text{weight}} = 4$

Weight	Formula	FontSize
1	$12 + 0 * 4$	12
2	$12 + 1 * 4$	16
3	$12 + 2 * 4$	20

w	Formula	FontSize
1	$12 + (w - 1) * 4$	12
2	$12 + (w - 1) * 4$	16
3	$12 + (w - 1) * 4$	20

w	Formula	FontSize
1	$12 + (w - 1) * \frac{\Delta\text{fontsize}}{\Delta\text{weight}}$	12
2	$12 + (w - 1) * \frac{\Delta\text{fontsize}}{\Delta\text{weight}}$	16
3	$12 + (w - 1) * \frac{\Delta\text{fontsize}}{\Delta\text{weight}}$	20

w	Formula	FontSize
1	$\text{font}_{\text{min}} + (w - 1) * \frac{\Delta\text{fontsize}}{\Delta\text{weight}}$	12
2	$\text{font}_{\text{min}} + (w - 1) * \frac{\Delta\text{fontsize}}{\Delta\text{weight}}$	16
3	$\text{font}_{\text{min}} + (w - 1) * \frac{\Delta\text{fontsize}}{\Delta\text{weight}}$	20

w	Formula	FontSize
1	$\text{font}_{\text{min}} + (w-1) * \frac{\text{font}_{\text{max}} - \text{font}_{\text{min}}}{\text{maxWkey} - \text{minWkey}}$	12
2	$\text{font}_{\text{min}} + (w-1) * \frac{\text{font}_{\text{max}} - \text{font}_{\text{min}}}{\text{maxWkey} - \text{minWkey}}$	16
3	$\text{font}_{\text{min}} + (w-1) * \frac{\text{font}_{\text{max}} - \text{font}_{\text{min}}}{\text{maxWkey} - \text{minWkey}}$	20

If we apply the same formula but we add more weights:

Weight	FontSize
1	12
2	?
3	?
4	?
5	?
6	20

w	Formula	FontSize
1	$\text{font}_{\text{min}} + (w-1) * \frac{\text{font}_{\text{max}} - \text{font}_{\text{min}}}{\text{maxWkey} - \text{minWkey}}$	12
2	$\text{font}_{\text{min}} + (w-1) * \frac{\text{font}_{\text{max}} - \text{font}_{\text{min}}}{\text{maxWkey} - \text{minWkey}}$	?
3	$\text{font}_{\text{min}} + (w-1) * \frac{\text{font}_{\text{max}} - \text{font}_{\text{min}}}{\text{maxWkey} - \text{minWkey}}$	?
4	$\text{font}_{\text{min}} + (w-1) * \frac{\text{font}_{\text{max}} - \text{font}_{\text{min}}}{\text{maxWkey} - \text{minWkey}}$	?
5	$\text{font}_{\text{min}} + (w-1) * \frac{\text{font}_{\text{max}} - \text{font}_{\text{min}}}{\text{maxWkey} - \text{minWkey}}$	?
6	$\text{font}_{\text{min}} + (w-1) * \frac{\text{font}_{\text{max}} - \text{font}_{\text{min}}}{\text{maxWkey} - \text{minWkey}}$	20

w	Formula	FontSize
1	$12 + (0) * 1,6$	12,0
2	$12 + (1) * 1,6$	13,6
3	$12 + (2) * 1,6$	15,2
4	$12 + (3) * 1,6$	16,8
5	$12 + (4) * 1,6$	18,4
6	$12 + (4) * 1,6$	20,0

And voilà.

When we have font_{min} and font_{max} equals to one, the function is discontinuous.