GRNsight: a web application and service for visualizing models of small- to medium-scale gene regulatory networks

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Figure 1: This is a teaser image.

ABSTRACT

GRNsight is a web application and service for visualizing small- to medium-scale gene regulatory networks (GRNs). A GRN consists of genes, transcription factors, and the regulatory connections between them which govern the level of expression of mRNA and protein from genes. GRNsight imports data from an adjacency matrix in an Excel workbook, then produces weighted or unweighted network graphs by representing genes as nodes and regulatory connections as edges, with colors, end markers, and thicknesses corresponding to the sign and magnitude of activation or repression. GRNsight visualizations can be modified through manually dragging nodes or adjusting sliders that change the force graph parameters. GRNsight is best-suited for visualizing networks of fewer than 35 nodes and 70 edges, although it accepts networks of up to 75 nodes or 150 edges. GRNsight has general applicability for displaying any small, unweighted or weighted network with directed edges for systems biology or other application domains. The GRNsight application (http://dondi.github.io/GRNsight/) and code (https://github.com/dondi/GRNsight) are available under the open source BSD license.

CCS CONCEPTS

• **Human-centered computing** → **Scientific visualization**; • **Computer systems organization** → *Redundancy*; Robotics; • **Networks** → Network reliability;

KEYWORDS

ACM proceedings, LaTeX, text tagging

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1 INTRODUCTION

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2017. ACM ISBN 123-4567-24-567/17/06…$15.00
https://doi.org/10.475/123_4

Figure 2: Ferrari LaFerrari. (Image courtesy Flickr user "gfreeman23.")

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2 MATERIALS AND METHODS

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$$P(t) = \frac{b^{\frac{t+1}{T+1}} - b^{\frac{t}{T+1}}}{b-1}, \tag{1}$$

where $t = 0, \ldots, T$, and b is a number greater than 1, litora torquent per conubia nostra, per inceptos himenaeos.

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$$L_o(x, \omega_o, \lambda, t) = L_e(x, \omega_o, \lambda, t) + \int_\Omega f_r(x, \omega_i, \omega_o, \lambda, t) L_i(x, \omega_i, \lambda, t)(\omega_i \cdot n) \mathrm{d}\omega_i \tag{2}$$

(Yes, that's the Rendering Equation.) [?]. Aenean pharetra ipsum eu mi fermentum dictum. Maecenas vel dolor semper, efficitur elit eget, bibendum diam. Duis vitae varius nisl. Proin aliquet sapien enim, eu vehicula ipsum euismod ut. Curabitur quis luctus quam, at ultricies ligula. Etiam imperdiet efficitur ipsum eu feugiat. Maecenas quis laoreet eros. Morbi molestie ac dui ac vestibulum. Donec maximus ex at neque posuere, et blandit tellus iaculis.

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Figure 3: A sample black and white graphic that has been resized with the `includegraphics` command.

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3 RESULTS AND DISCUSSION

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3.1 A Subsection

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$$F = \{F_x \in F_c : (|S| > |C|) \cap (\text{minPixels} < |S| < \text{maxPixels}) \cap (|S_{\text{connected}}| > |S| - \epsilon)\} \quad (3)$$

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3.2 Another Subsection

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4 CONCLUSION AND FUTURE WORK

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