

Better Online Deterministic Packet Routing on Grids

Számítógép-hálózatok és osztott rendszerek

Kádár Tamás Csaba, Kedves Nándor

November 22, 2016

1. Bevezetés
2. Rács Modell
3. Elements
4. Conclusion

Bevezetés

Modell

Modellje:

- $G = (V, E)$ irányított gráf
- B buffer méret, c élek kapacitása, ahol $B, c > 0$

A hálózat topológiája irányított egyenes, amely n vertexből áll

$$V = \{v_0, v_1, \dots, v_{n-1}\}, E = \{(v_{i-1}, v_i) \mid 0 < i < n\}$$

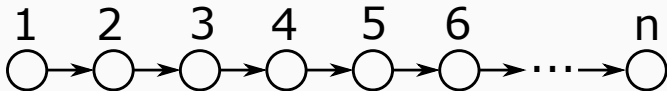


Figure 1: Lineáris hálózatmodell

Kérés (Request)

A kérést egy számhármassal adhatjuk meg, $r = (a_i, b_i, t_i)$

- a_i a forrás csomópont
- b_i a cél csomópont
- t_i az időpont amikor a kérés érkezik

, ahol $a_i, b_i \in V, t_i \in \mathbb{N}$

Minden time stepben, a routing algoritmus:

- törli a célba érkezett csomagokat
- minden más csomagra, beleértve az éppen beérkezőket is eldönti, hogy:
 - törli
 - tárolja az aktuális csomópont bufferjében
 - továbbküldi a következő vertexnek

Rács Modell

Kiindulunk a már említett modellből és a következő modellt építjük fel:

- $G^{st} = (V^{st}, E^{st})$ irányított aciklikus végtelen gráf, amiben $c^{st}(e)$ az élek kapacitása. $V^{st} := V \times \mathbb{N}$, ahol minden $v \in V$ vertexnek végtelen számú másolata van a G^{st} -ben, melyet a $(v, t) \in V^{st}$ azonosít. $E^{st} := E_0 \cup E_1$, ahol az E_0 tartalmazza a csomópontok közötti éleket, melyek c kapacitással rendelkeznek és a E_1 a ugyanazon csomópont time steppek közötti élet tartalmazza, mely kapacitása B
- a kérés a következőképpen alakul $r_i^{st} = ((a_i, t_i), \text{row}(b_i))$, ahol a $\text{row}(b_i)$, a cél csomópont sorát jelöli

Az egyenes modelltől a rácsmodellig

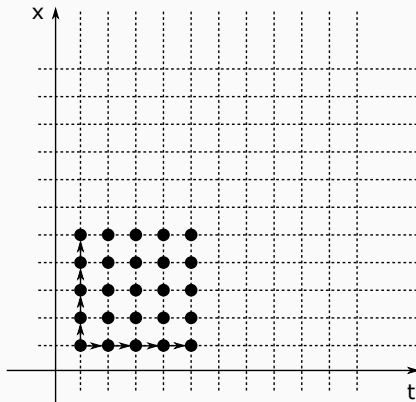


Figure 2: Rácsos hálózatmodell

This frame uses the `smallcaps` titleformat.

Potential Problems

Be aware, that not every font supports small caps. If for example you typeset your presentation with pdfTeX and the Computer Modern Sans Serif font, every text in smallcaps will be typeset with the Computer Modern Serif font instead.

This frame uses the `allsmallcaps` titleformat.

Potential problems

As this titleformat also uses smallcaps you face the same problems as with the `smallcaps` titleformat. Additionally this format can cause some other problems. Please refer to the documentation if you consider using it.

As a rule of thumb: Just use it for plaintext-only titles.

This frame uses the `allcaps` titleformat.

Potential Problems

This titleformat is not as problematic as the `allsmallcaps` format, but basically suffers from the same deficiencies. So please have a look at the documentation if you want to use it.

Elements

The theme provides sensible defaults to
`\emph{emphasize}` text, `\alert{accent}` parts
or show `\textbf{bold}` results.

becomes

The theme provides sensible defaults to *emphasize* text, **accent** parts or
show **bold** results.

Font feature test

- Regular
- *Italic*
- SMALLCAPS
- **Bold**
- **Bold Italic**
- **Bold SmallCaps**
- Monospace
- *Monospace Italic*
- Monospace Bold
- *Monospace Bold Italic*

Items

- Milk
- Eggs
- Potatos

Enumerations

1. First,
2. Second and
3. Last.

Descriptions

PowerPoint Meeh.

Beamer Yeeeha.

- This is important

- This is important
- Now this

- This is important
- Now this
- And now this

- This is really important
- Now this
- And now this

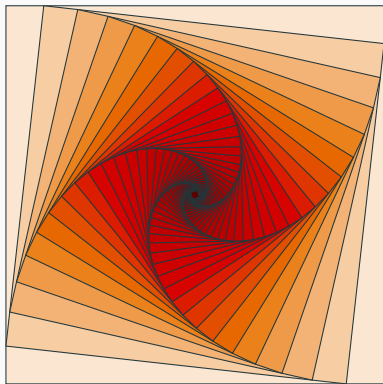


Figure 3: Rotated square from texample.net.

Table 1: Largest cities in the world (source: Wikipedia)

City	Population
Mexico City	20,116,842
Shanghai	19,210,000
Peking	15,796,450
Istanbul	14,160,467

Three different block environments are pre-defined and may be styled with an optional background color.

Default

Block content.

Alert

Block content.

Example

Block content.

Default

Block content.

Alert

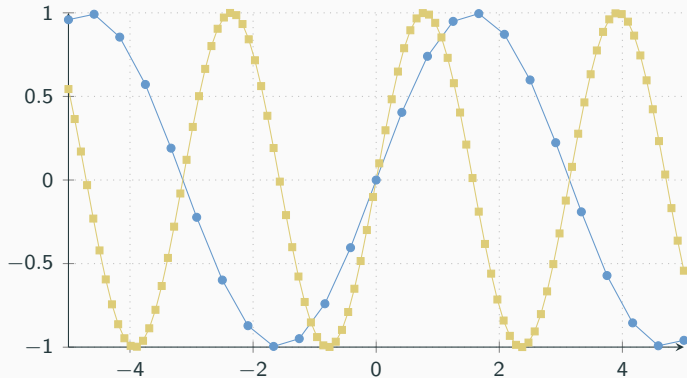
Block content.

Example

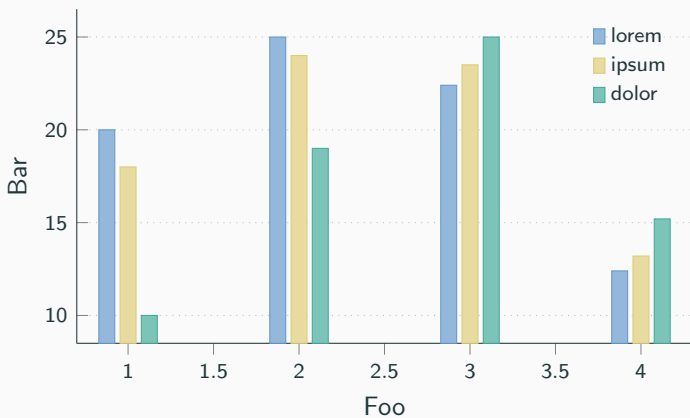
Block content.

$$e = \lim_{n \rightarrow \infty} \left(1 + \frac{1}{n}\right)^n$$

Line plots



Bar charts



Veni, Vidi, Vici

metropolis defines a custom beamer template to add a text to the footer. It can be set via

```
\setbeamertemplate{frame footer}{My custom footer}
```

Some references to showcase `[allowframebreaks]` [4, 2, 5, 1, 3]

Conclusion

Get the source of this theme and the demo presentation from

`github.com/matze/mtheme`

The theme *itself* is licensed under a Creative Commons Attribution-ShareAlike 4.0 International License.



Questions?

Backup slides

Sometimes, it is useful to add slides at the end of your presentation to refer to during audience questions.

The best way to do this is to include the `appendixnumberbeamer` package in your preamble and call `\appendix` before your backup slides.

metropolis will automatically turn off slide numbering and progress bars for slides in the appendix.

References I



P. Erdős.

A selection of problems and results in combinatorics.

In *Recent trends in combinatorics (Matrahaza, 1995)*, pages 1–6.
Cambridge Univ. Press, Cambridge, 1995.



R. Graham, D. Knuth, and O. Patashnik.

Concrete mathematics.

Addison-Wesley, Reading, MA, 1989.



G. D. Greenwade.

The Comprehensive Tex Archive Network (CTAN).

TUGBoat, 14(3):342–351, 1993.



D. Knuth.

Two notes on notation.

Amer. Math. Monthly, 99:403–422, 1992.



H. Simpson.

Proof of the Riemann Hypothesis.

preprint (2003), available at

<http://www.math.drofnats.edu/riemann.ps>, 2003.