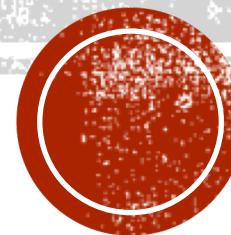


RESTMULE: ENABLING RESILIENT CLIENTS FOR REMOTE APIs

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Horizon 2020
European Union funding
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THE PROBLEM

- API Request Rate Limits
- Comprehensive documentation

The screenshot shows the Stack Overflow homepage with two questions listed:

- First eigenvalue of Laplacian Matrix greater than zero**
To calculate eigenvalues of Laplacian matrix I've used numpy.linalg.eig function. As the first value instead of 0 I've got 2.6645352591003757e-15. What is wrong in the calculation? Can it be ...
python, numpy, matrix, eigenvalue
- Add an alarm to identify changes in a sensors**
I am trying to modificate a sensor web view, it's called hobo and the application that shows it is hobonode viewer, when a sensor passes the stablished ranges an alarm is activated, but the web doesn't ...
jsp

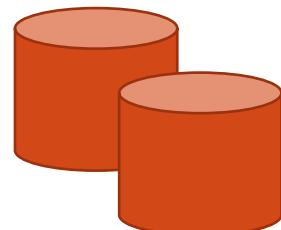
<http://stackoverflow.com/>

The screenshot shows the GitHub search results for "simulink" and a specific documentation page:

- 920 repository results**
 - darenlee/SimulinkARDroneTarget**
Deploy MATLAB Simulink model automatically to Parrot AR Drone with Embedded Coder C code generation
GitHub Developer
 - analogdevice REST API v3**
Scripts and tools · MATLAB and Simulink
matlab, simulink, Rate Limit
The overview documentation describes the [rate limit rules](#). You can check your current rate limit status at any time using the Rate Limit API described below.
- GitHub Developer**
 - API Docs, Blog, Early Access, Versions
 - Reference, Guides, Libraries

<http://github.com>

- HTTP RESTful APIs
- OpenAPI specification



THE SOLUTION: RESTMULE

- Framework able to generate resilient client applications for remote APIs over the HTTP protocol
- **Reusable facilities:**
 - Request rate policy handling
 - Asynchronous paged-response traversal
 - Response caching
 - API-specific object types
 - Information about data acquisition process
 - Endpoint groupings
- **Java Code generator:**
 - OpenAPI Specification + **configuration script** → resilient java client

```
Http Request http://x.y.com?page=1  
Http Response Link: current=1, total=3
```

Mappings

CONCLUSION

- Generated clients can resiliently execute complex queries expressed concisely.
- RestMule enables developers to focus on their core mining and analysis logic by producing resilient remote-API clients.
- Future Work
 - More resilience strategies
 - Distributed, collaborative analysis workflows
 - Evaluation of programming time and client generation effort

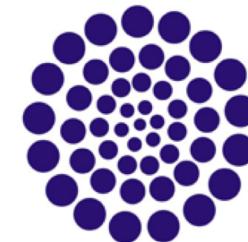
RESOURCES

Beatriz A. Sanchez, Konstantinos Barmpis, Patrick Neubauer, Richard F. Paige, and Dimitrios S. Kolovos. 2018. RestMule: Enabling Resilient Clients for Remote APIs. In *MSR '18: 15th International Conference on Mining Software Repositories*, May 28–29, 2018, Gothenburg, Sweden.

<https://github.com/beatrizzsanchez/RestMule/>



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