



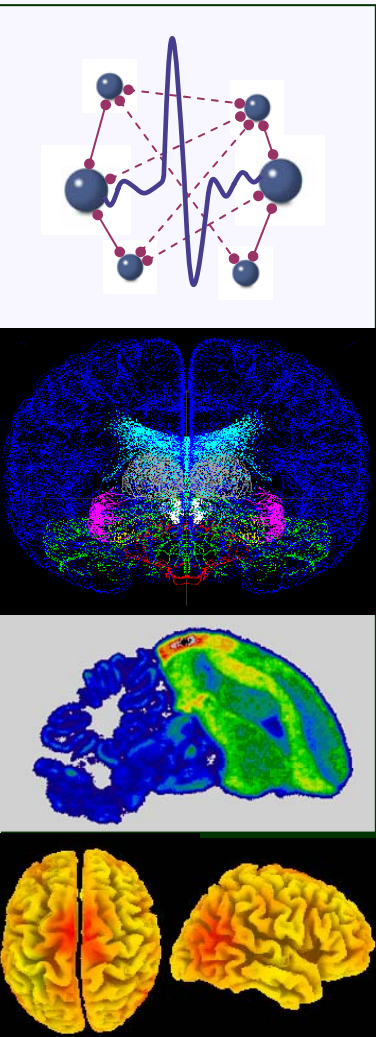
CARMEN

ENHANCING COLLABORATION
IN NEUROSCIENCE

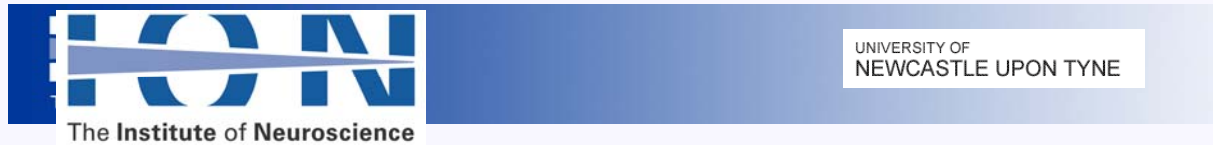
CARMEN: A VRE for Neuroscience

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THE UNIVERSITY *of York*



CARMEN - Code Analysis, Repository and Modelling for e-Neuroscience



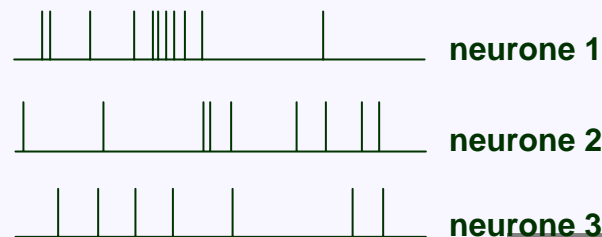
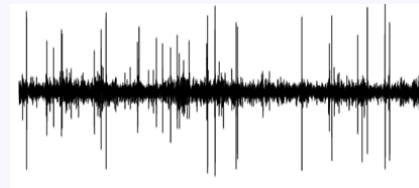
CARMEN – Neural Mapping



*Understanding the brain
may be the greatest
informatics challenge of
the 21st century*



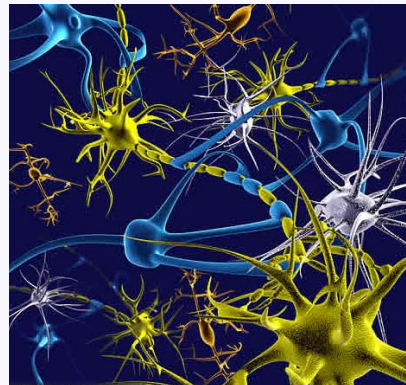
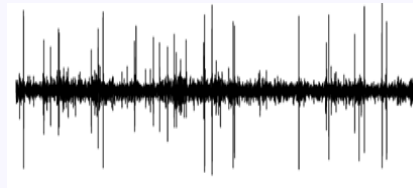
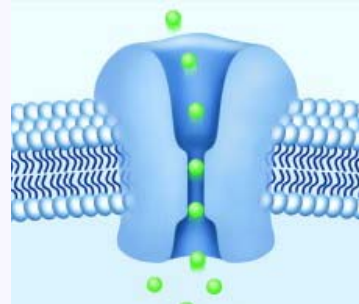
- raw voltage signal data collected by patch-clamp and single & multi-electrode array recording
- novel optical recording, particularly the activity dynamics of large networks



- resolving the 'neural code' from the timing of action potential activity

Layers of Integration

*Understanding the brain
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- determining ion channel contribution to the timing of action potentials
- resolving the 'neural code' from the timing of action potential activity
- examining integration within networks of differing dimensions

Current Problems in Neuroinformatics



- Data is:
 - expensive to collect but rarely shared
 - proprietary and locally described
- The result:
 - a shortage of analysis techniques that can be applied across neuronal systems
 - Limited interaction between research centres with complementary expertise

- Bowker's "Standard Scientific Model"¹
 - Collect data
 - Publish papers
 - Gradually lose the original data
- ¹The New Knowledge Economy and Science and Technology Policy, G.C. Bowker, E1-30-03-05

- Problems:
 - papers often draw conclusions from unpublished data
 - inability to replicate experiments
 - data cannot be re-used

but... code can be lost too

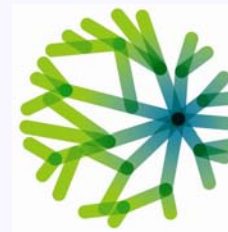


- Bowker's Model
 - Collect data
 - Publish papers
 - Gradually lose the original data
 - Problems:
 - papers often draw conclusions from unpublished data
 - inability to replicate experiments
 - data cannot be re-used
 - Solution
 - Data Repositories
- Computational Science
 - Write codes
 - Publish papers
 - Gradually lose the codes
 - Problems:
 - papers often draw conclusions from the results of unpublished codes
 - inability to replicate experiments
 - codes cannot be re-used
 - Solution
 - Service Repositories

CARMEN Objectives



- Create ‘virtual laboratory’ for neurophysiological data
- Provide repository for:
 - archiving, sharing, integration and discovery of data
 - services that operate on the data
- Develop extensible ‘toolkit’ for data extraction, analysis and modelling



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