

Visualising Structural Barriers to Interdisciplinary Learning



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Interdiscipinarity distances and diversity ?

Electronic Engineering

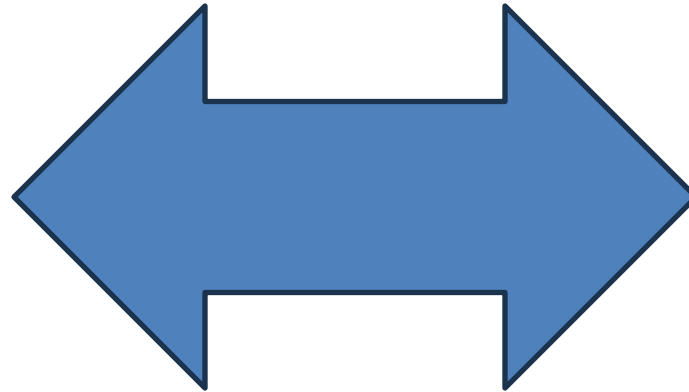


Computer Engineering

Neuroscience



Psychology



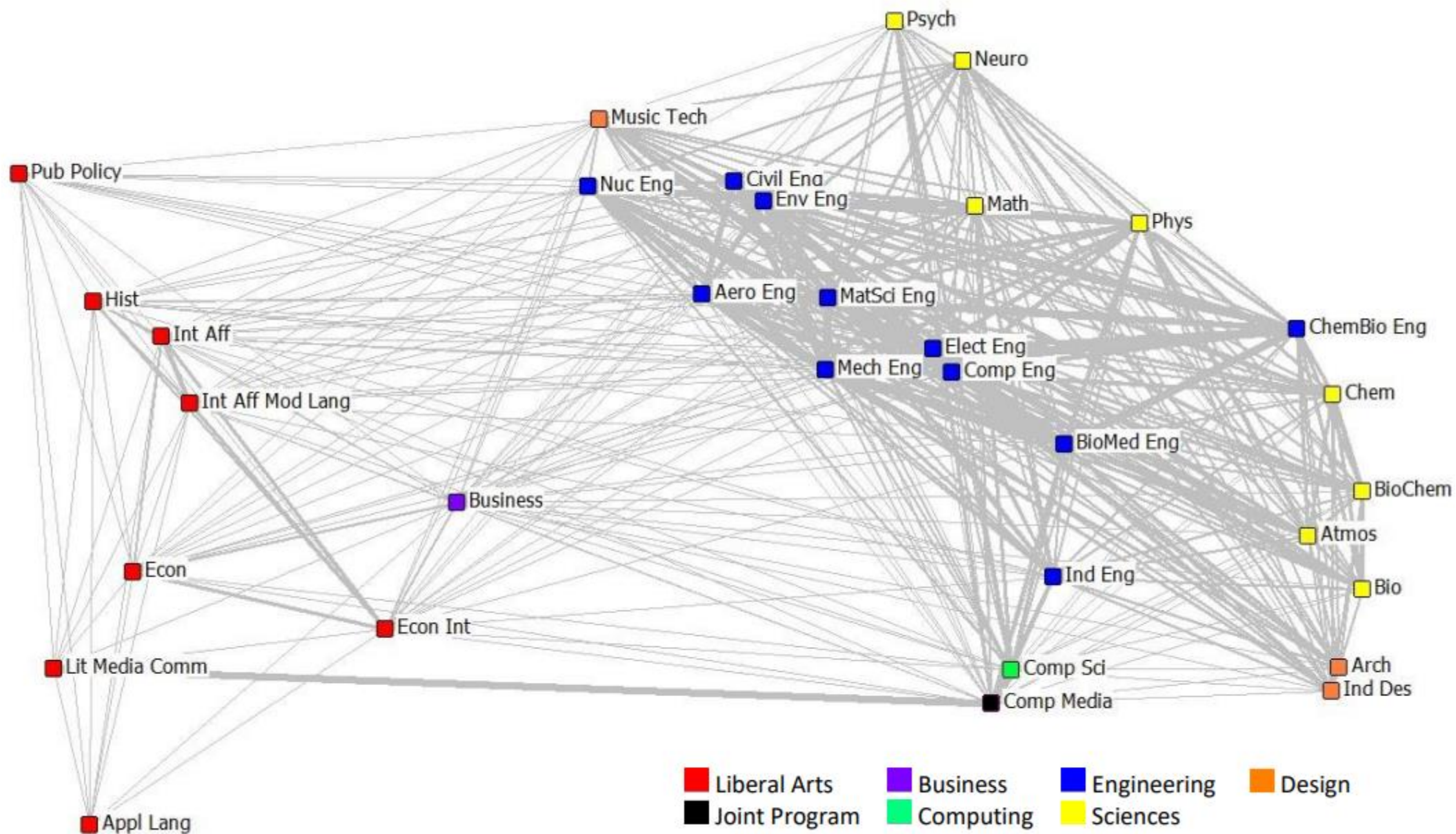
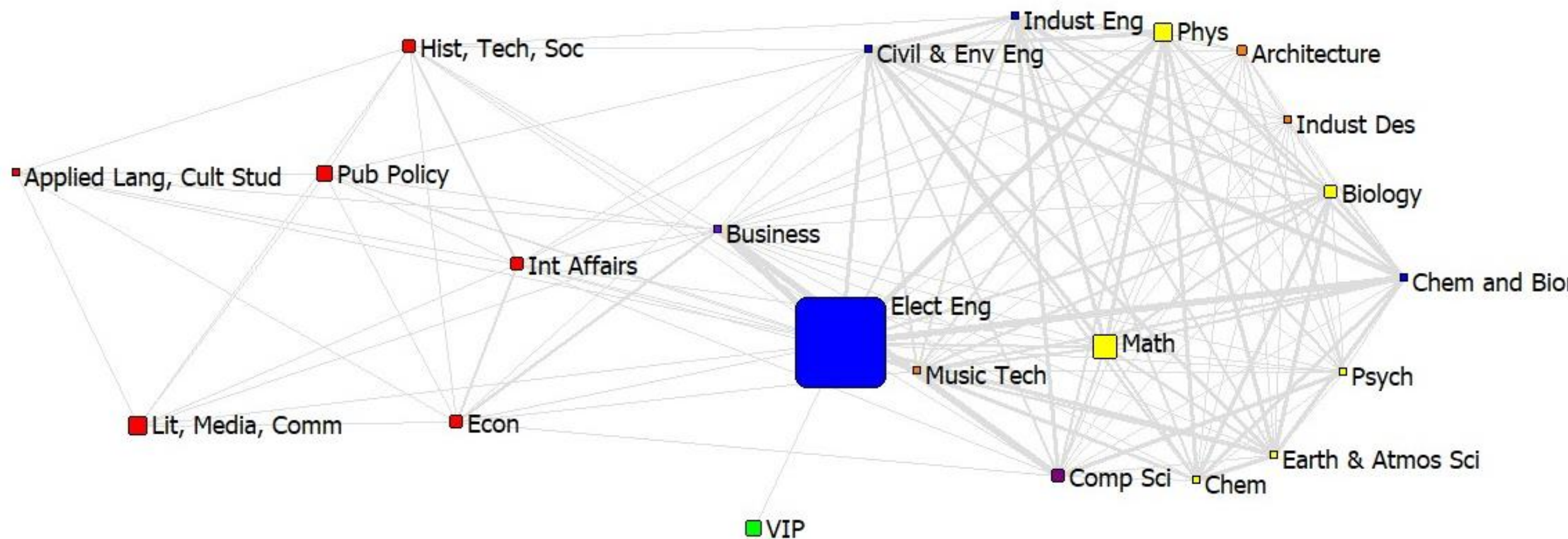
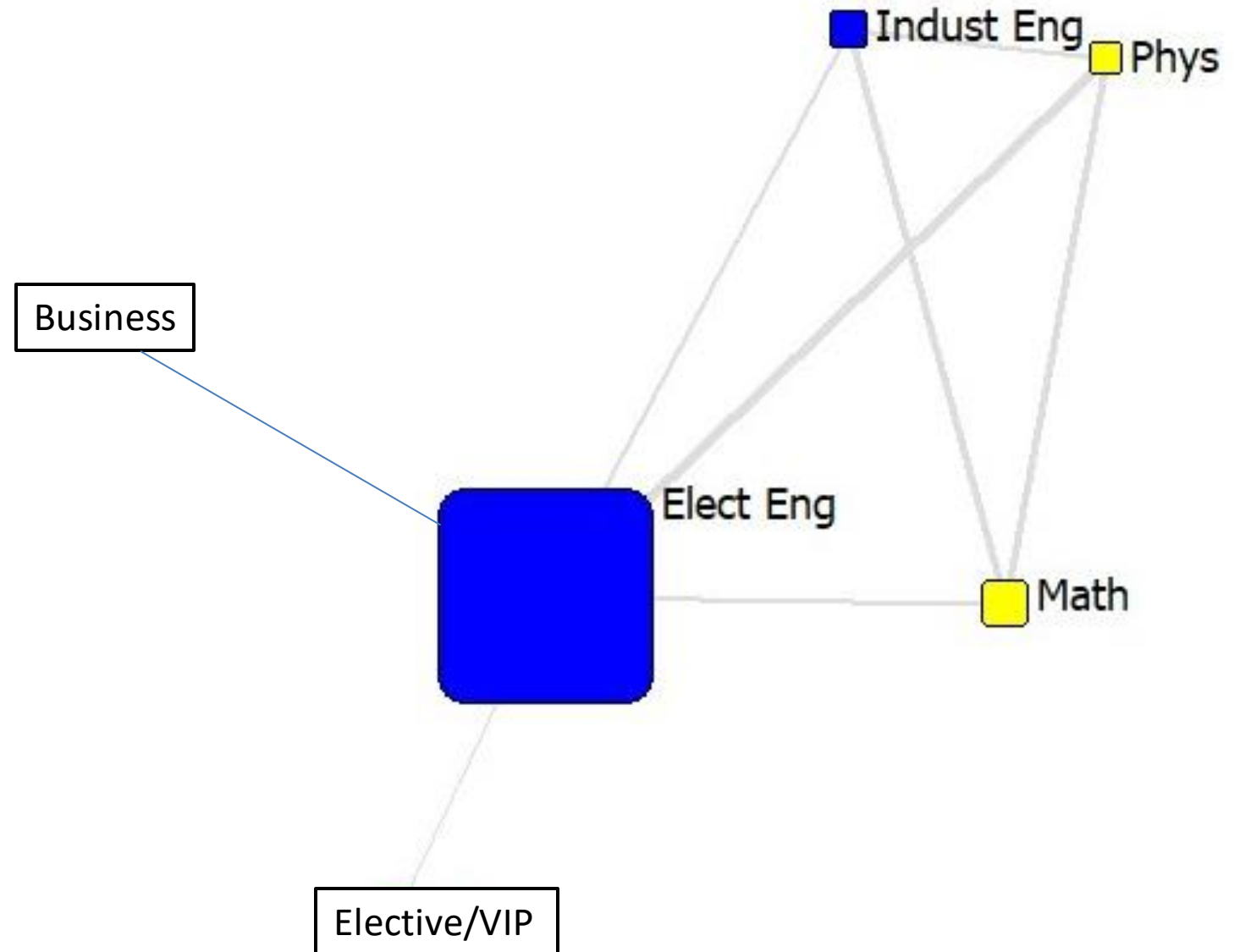


Fig. 4. Disciplinary Distance by the Combined Scale

Electrical Engineering USA



Electrical Engineering UK



VIP (Vertically Integrated Projects) Consortium



49 Consortium Institutions

South America

Universidad de Chile
Universidad del Norte
Universidad ICESI
Universidad Mayor
Universidade Estadual de Campinas

Europe

Malmö University
Riga Technical University
Rīga Stradiņš University
University of Bath
University of St. Andrews
University of Strathclyde
University of Galway

Asia

Inha University
National Dong Hwa University
National Taiwan University

Middle East & North Africa

American University of Beirut
Lebanese American University
The American University in Cairo

United States

Arizona State University
Boise State University
Colorado State University
Drexel University
Georgia College and State Univ.
Georgia Institute of Technology
Georgia Southern University
Georgia State University
Howard University
Iowa State University
Kennesaw State University
Morehouse College
NYU Tandon School of Engineering
Polytechnic University of Puerto Rico

Africa & Australia

University of New South Wales
University of Pretoria
Strathmore University

Purdue University
Rice University
Stony Brook University
Texas A&M University
The Cooper Union
University of Arizona
University of California Davis
University of Delaware
University of Georgia
University of Hawaii
University of Michigan
Virginia Commonwealth University
Virginia Tech



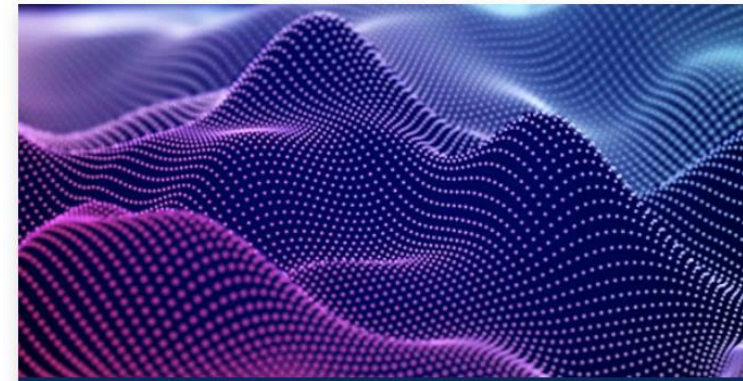
Energy for Development



Inclusive Transitions through Early Years & Beyond



STEM Education and Public Engagement



Smart Voice

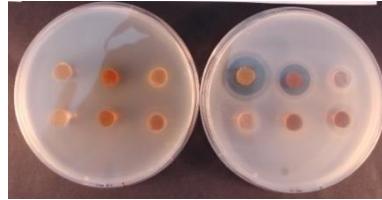


Drug Discovery Team Project

Biological Sample



Bioassays



Microbiology:
Discovery of novel
bioactive
Streptomyces species

Selective
isolation of
Streptomyces
spp.

RGB

Segmentation

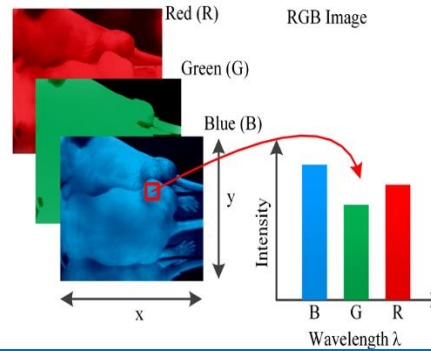
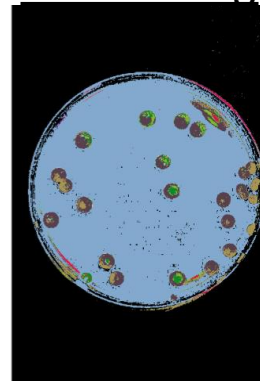
Classification

HSI

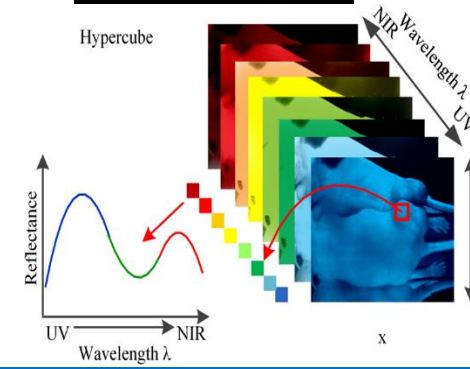
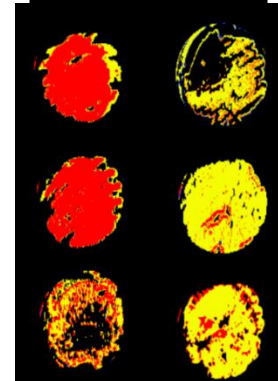
Segmentation

Classification

RGB Image
Processing

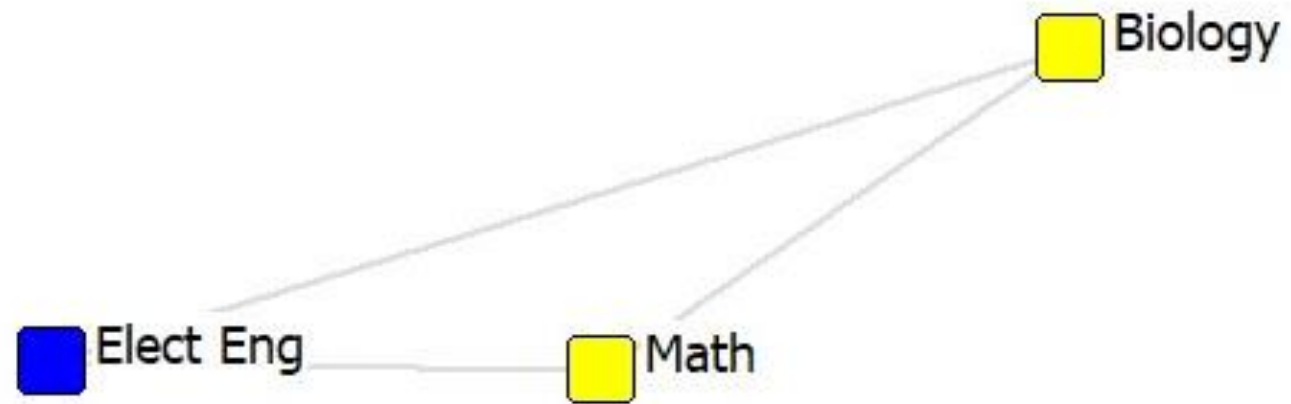


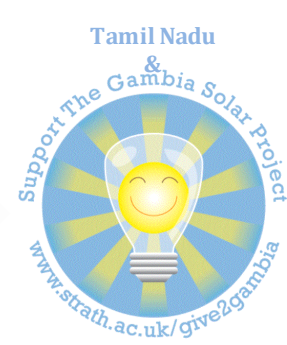
HSI Image
Processing

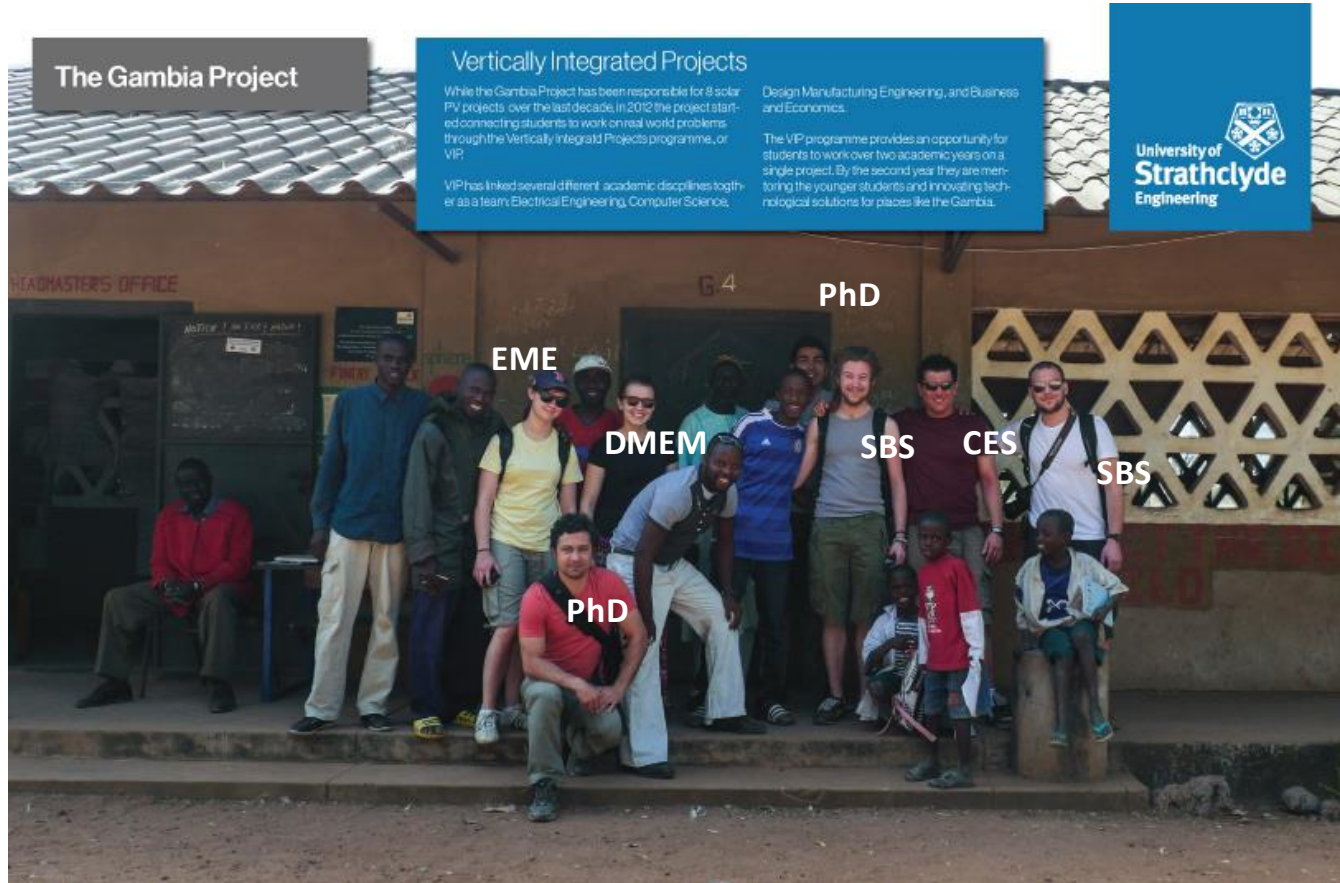


Engineering:
Colour/Hyper Spectral
Imaging (HSI)
dereplication to
streamline drug
discovery

Drug Discovery

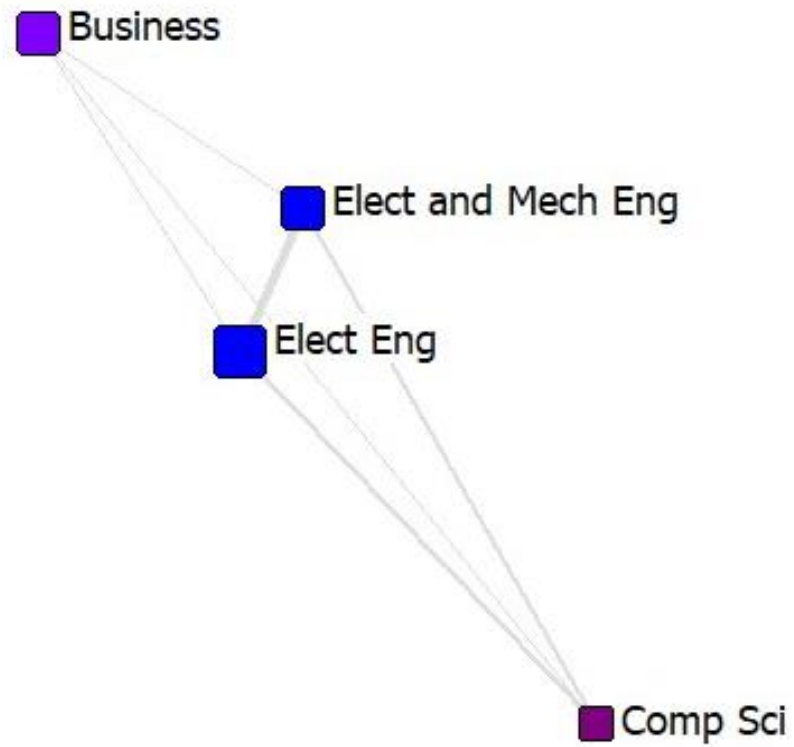






Bold, Ambitious, Innovative and Collaborative

Energy for Development



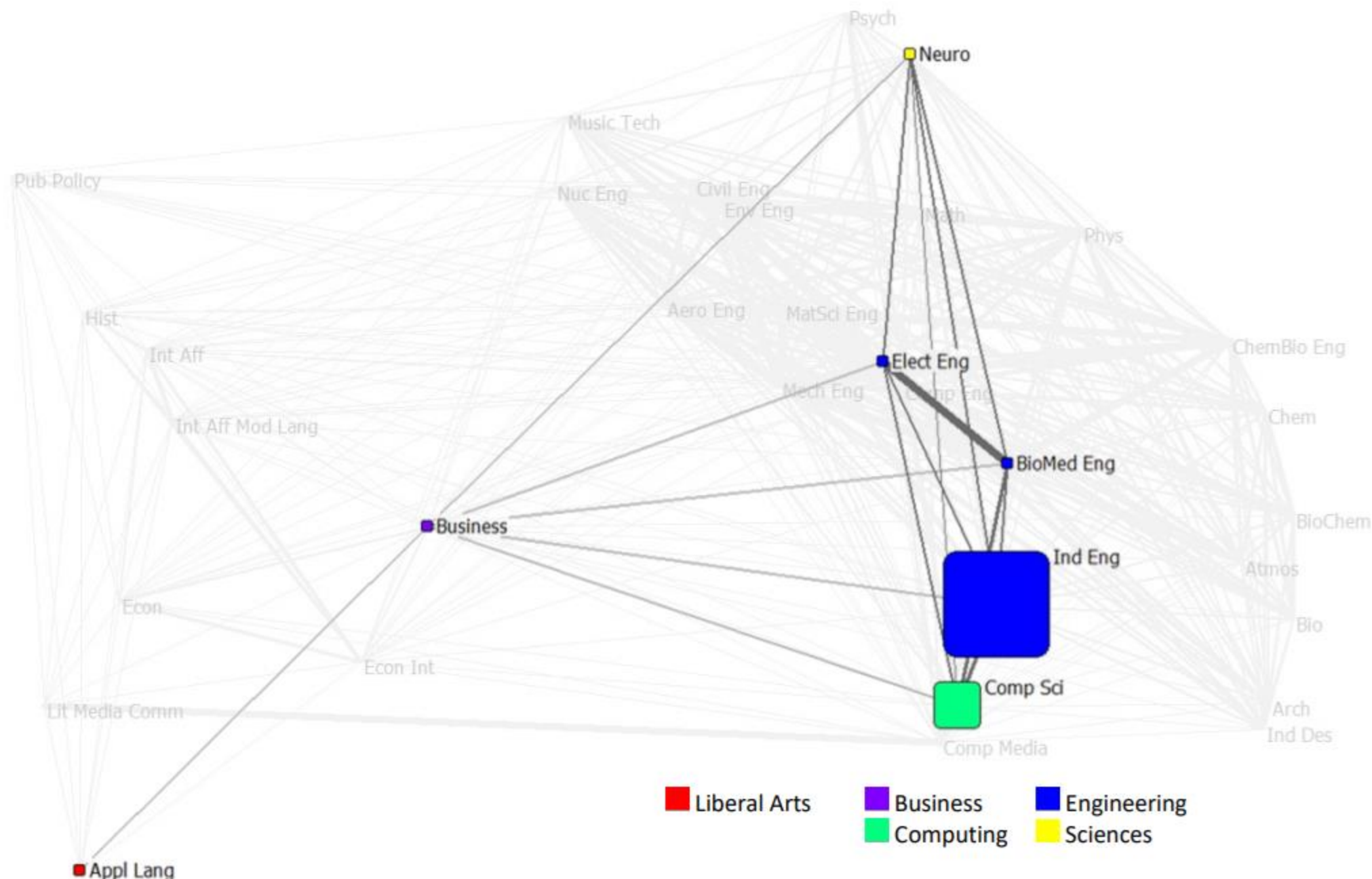


Fig. 6. Health Informatics on FHIR: 18 students, 7 majors, Diversity Index of 0.30

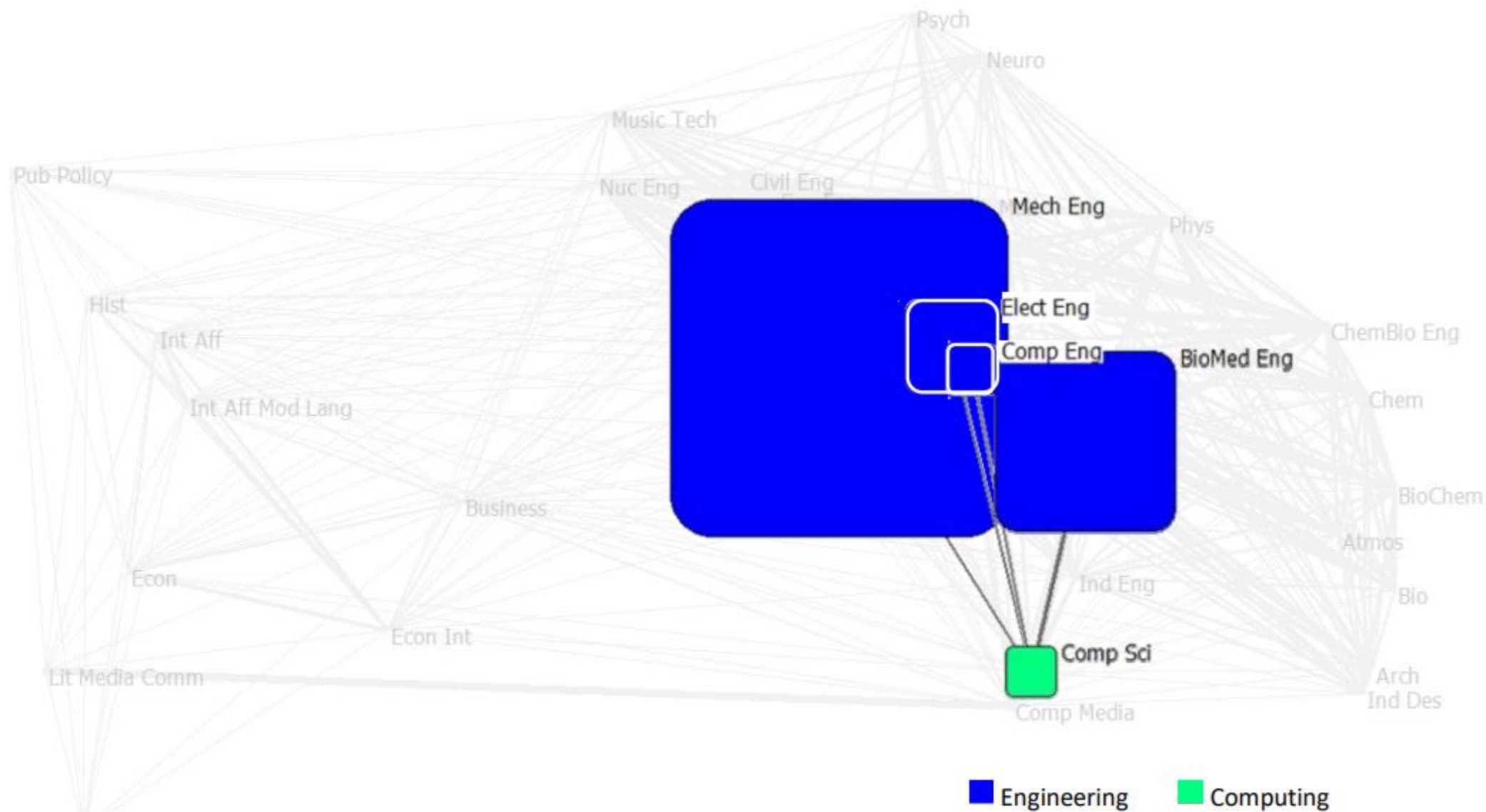


Fig. 7. Robotic Human Augmentation: 55 students, 5 majors, Diversity Index of 0.18

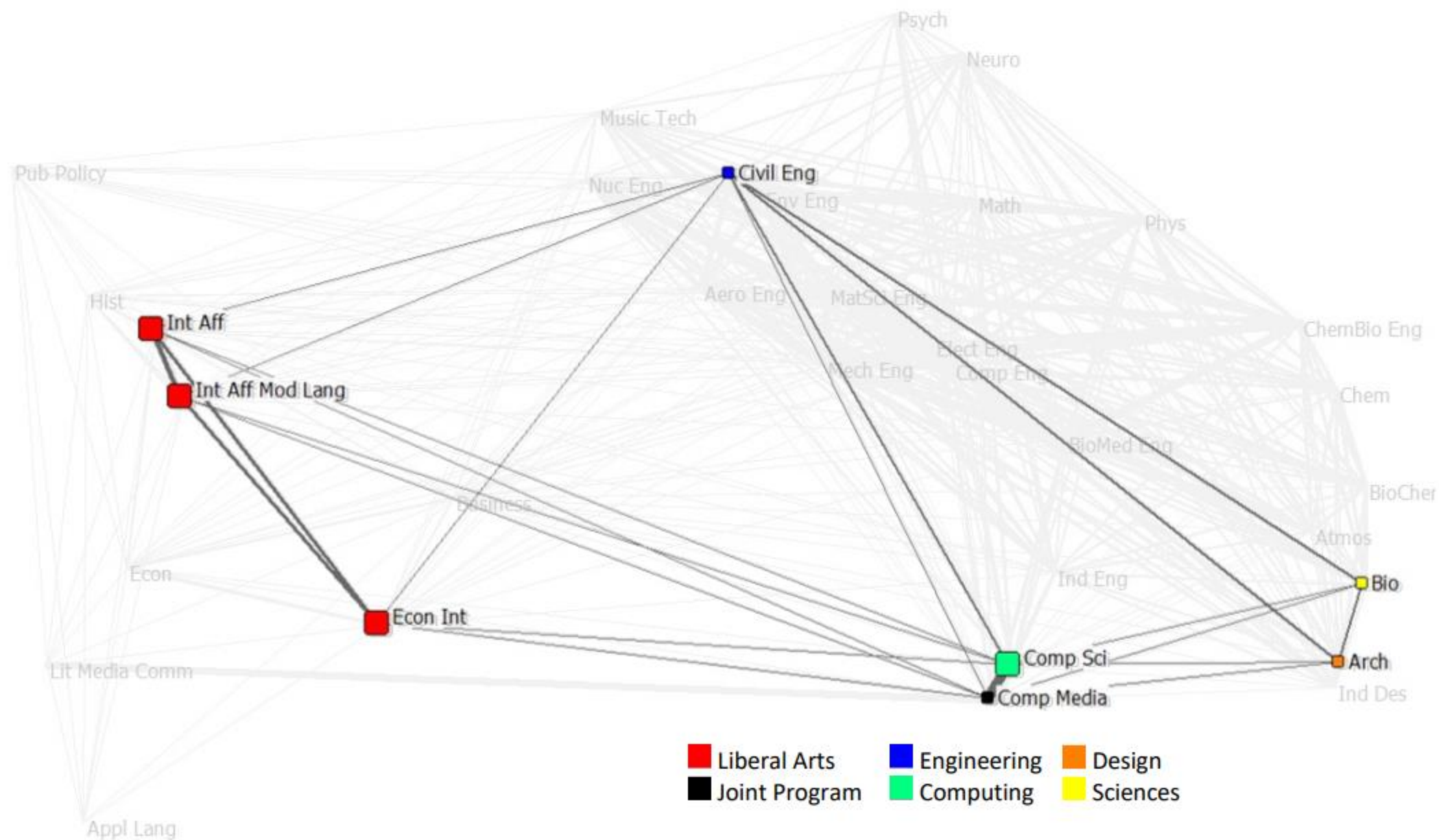


Fig. 8. Global Social Entrepreneurship: 12 students, 8 majors, Diversity Index of 0.40

Summary

Propose a mechanism for visualising and quantifying interdisciplinarity

Compare equivalent courses in US and UK

- US courses are much more diverse
- UK processes are not geared to accommodating such diversity
- Not surprising in UK we have issues implementing highly interdisciplinary programs

Also compared Vertically integrated project teams