# Using Thesauri to Understand Faculty Research

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UMKC Libraries PSP Forum
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# Bee vision

**Bee vision**

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Left: yellow flower; Center: same flower with yellow bullseye on white; Right: same flower with dark bullseye on cream.

*Photo Klauss Schmitt, Weinheim, Germany*

From The Why? Files blog

Humans perceive a wider range of visible color spectrum than bees. However, we see a yellow flower. Bees, see some UV and a limited portion of the human-visible spectrum, so they see a yellow bullseye with a dark center that enables them to get right to the rich pollen (the center image).

# Database searching - keyword versus controlled vocabulary / thesaurus

Databases often make *keywords* searchable in either full text of documents, or as "tags" or metadata (e.g. "subject headings," "Engineering terms," etc.) in separate *search fields*.

Because different people use different keywords for the same topic/subject, *controlled vocabularies* were developed for specialized subjects for use in these separate fields.

A *thesaurus* in this context is a controlled vocabulary developed with an effort is made to define the relationships between terms.

# Why use a thesaurus?

- Authority
- Proven utility over time
- Regularly updated for new trends
- Ease of use / efficiency of searching

Two major examples of thesauri for database searching are MeSH (**Me**dical **S**ubject **H**eadings) in PubMed and the Ei Thesaurus in Compendex.

(cf. Cleveland and Cleveland, *Introduction to Indexing and Abstracting*, Chapter 4, for a more thorough introduction to controlled vocabulary and thesauri)

# Preliminary/Exploratory Methodology

1. Select a database with a controlled vocabulary. (Compendex)
2. Search for documents by affiliation (UMKC)
3. Limit to tenure-track faculty from School of Computing and Engineering (SCE)
4. Limit to time period 2010-2013
5. Find controlled vocabulary terms used to identify the documents.
6. Using the structure of the Ei Thesaurus, create a hierarchical structure of controlled vocabulary terms specific to UMKC SCE research

**Proceedings of the 2012 International Conference on Electromagnetics in Advanced Applications, ICEAA'12**

2012, Article number6328773, Pages 952-953

2012 14th International Conference on Electromagnetics in Advanced Applications, ICEAA 2012; Cape Town; South Africa; 2 September 2012 through 7 September 2012; Category numberCFP1268B-ART; Code 93620

# Numerical assessment of high-frequency mutual coupling between sources on convex surfaces with variable curvatures ( Conference Paper )

Chatterjee, D.[a], Reddy, C.J.[b]

[a] CSEE Department, University of Missouri Kansas City, 5110 Rockhill Road, KC, MO 64110, United States

[b] Applied ElectroMagnetics, 144 Research Drive, Hampton, VA 23666, United States

View references (10)

## Abstract

Analysis of mutual coupling between slots on variable curvatures is analyzed via use of high-frequency asymptotic methods and the full-wave numerical solver FEKO. Results for isolation parameter, $S_{12}$, between two axial slots on a circular cone, obtained via FEKO and measurements, are included here. Excellent agreement between FEKO simulations and measurements suggest that the accuracy of the high-frequency asymptotic formulations can be assessed with confidence against the results from the full wave solver for convex surfaces with variable curvatures. © 2012 IEEE.

## Indexed keywords

Circular cones; Convex surfaces; Full waves; High frequency HF; High-frequency asymptotics; Isolation parameters; Mutual coupling; Numerical solvers; Simulations and measurements; Variable curvature

**Engineering controlled terms:** Electromagnetism

**Engineering main heading:** Numerical methods

ISBN: 978-146730335-4 **Source Type:** Conference Proceeding **Original language:** English

DOI: 10.1109/ICEAA.2012.6328773 **Document Type:** Conference Paper

**Sponsors:** IEEE Antennas and Propagation Society



This is SCOPUS - Note the indexing section

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**Abstract** | Detailed

Highlight search terms

Record 1 from Compendex & GEOBASE for: (((((chatterjee) WN AU) AND ((university of missouri kansas city) WN AF))) AND ({chatterjee d} WN AU)), 1969-2013

Check record to add to Selected Records

1. **Numerical assessment of high-frequency mutual coupling between sources on convex surfaces with variable curvatures**

Chatterjee, D.[1]; Reddy, C.J.[2]

**Source:** *Proceedings of the 2012 International Conference on Electromagnetics in Advanced Applications, ICEAA'12*, p 952-953, 2012, *Proceedings of the 2012 International Conference on Electromagnetics in Advanced Applications, ICEAA'12*; **ISBN-13:** 9781467303354; **DOI:** 10.1109/ICEAA.2012.6328773; **Article number:** 6328773; **Conference:** 2012 14th International Conference on Electromagnetics in Advanced Applications, ICEAA 2012, September 2, 2012 - September 7, 2012; **Sponsor:** IEEE Antennas and Propagation Society; **Publisher:** IEEE Computer Society

**Author affiliations:**

[1] CSEE Department, **University of Missouri Kansas City**, 5110 Rockhill Road, KC, MO 64110, United States

[2] Applied ElectroMagnetics, 144 Research Drive, Hampton, VA 23666, United States

**Abstract:**

Analysis ( tual coupling between slots on variable curvatures is analyzed via use of high-frequency asymptotic methods and the full-wave numerica er FEKO. Results for isolation parameter, S12, between two axial slots on a circular cone, obtained via FEKO and measurements, are inclu ere. Excellent agreement between FEKO simulations and measurements suggest that the accuracy of the high-frequency asymptotic formulati an be assessed with confidence against the results from the full wave solver for convex surfaces with variable curvatures. © 2012 IEEE.(10

**Main heading:** Numerical methods

**Controlled terms:** Electromagnetism

**Uncontrolled terms:** Circular cones - Convex surfaces - Full waves - High frequency HF - High-frequency asymptotics - Isolation parameters - Mutual coupling - Numerical solvers - Simulations and measurements - Variable curvature

**Classification Code:** 701 Electricity and Magnetism - 921.6 Numerical Methods

**Database:** Compendex

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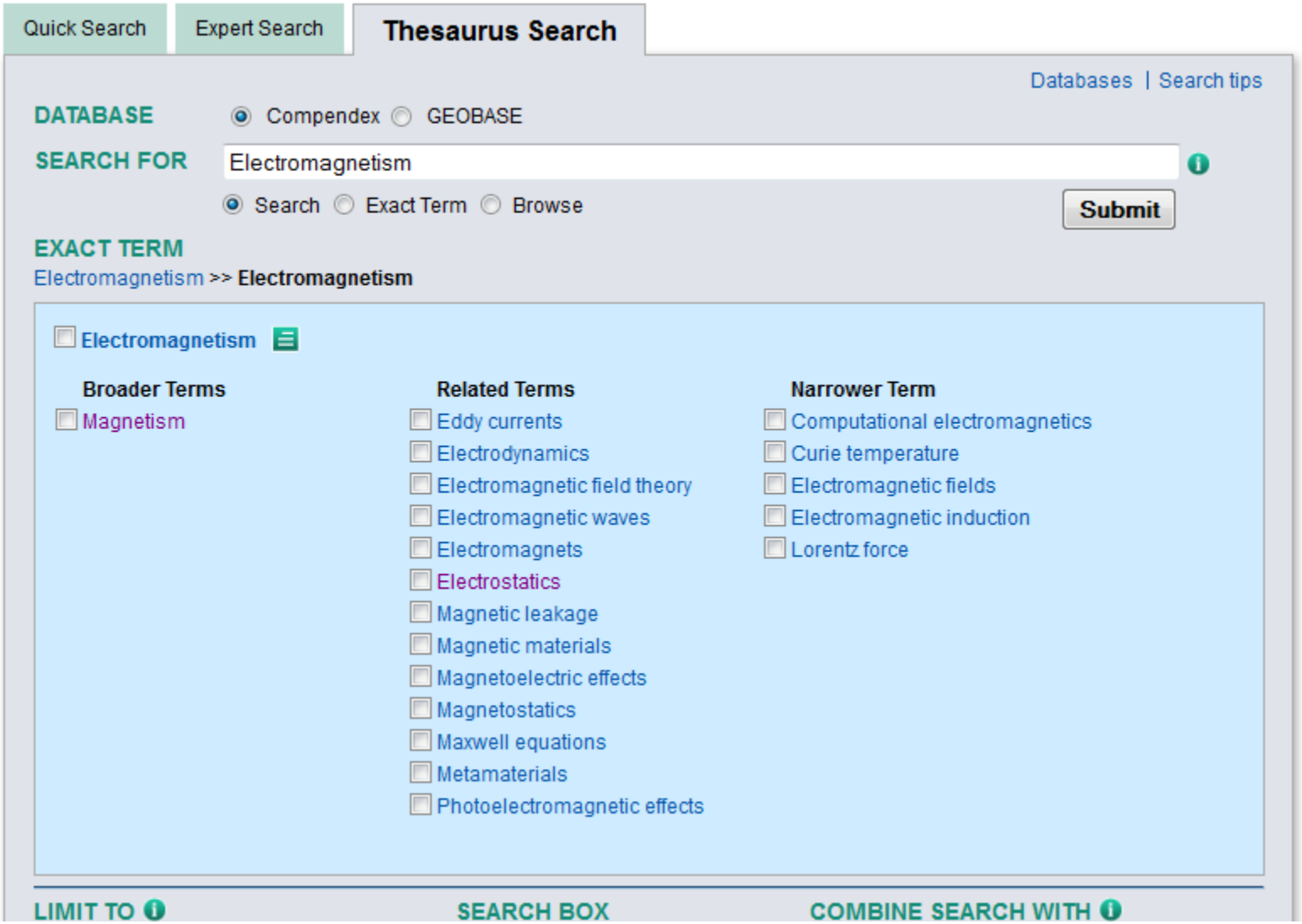
The same document in COMPENDEX. Note the linking to the controlled terms and the classification codes.




COMPENDEX enables the searcher to view the Ei Thesaurus, determining broader/narrower terms.

# Exploratory results

Ei Controlled Terms and Ei Main Headings were harvested into an Excel spreadsheet.

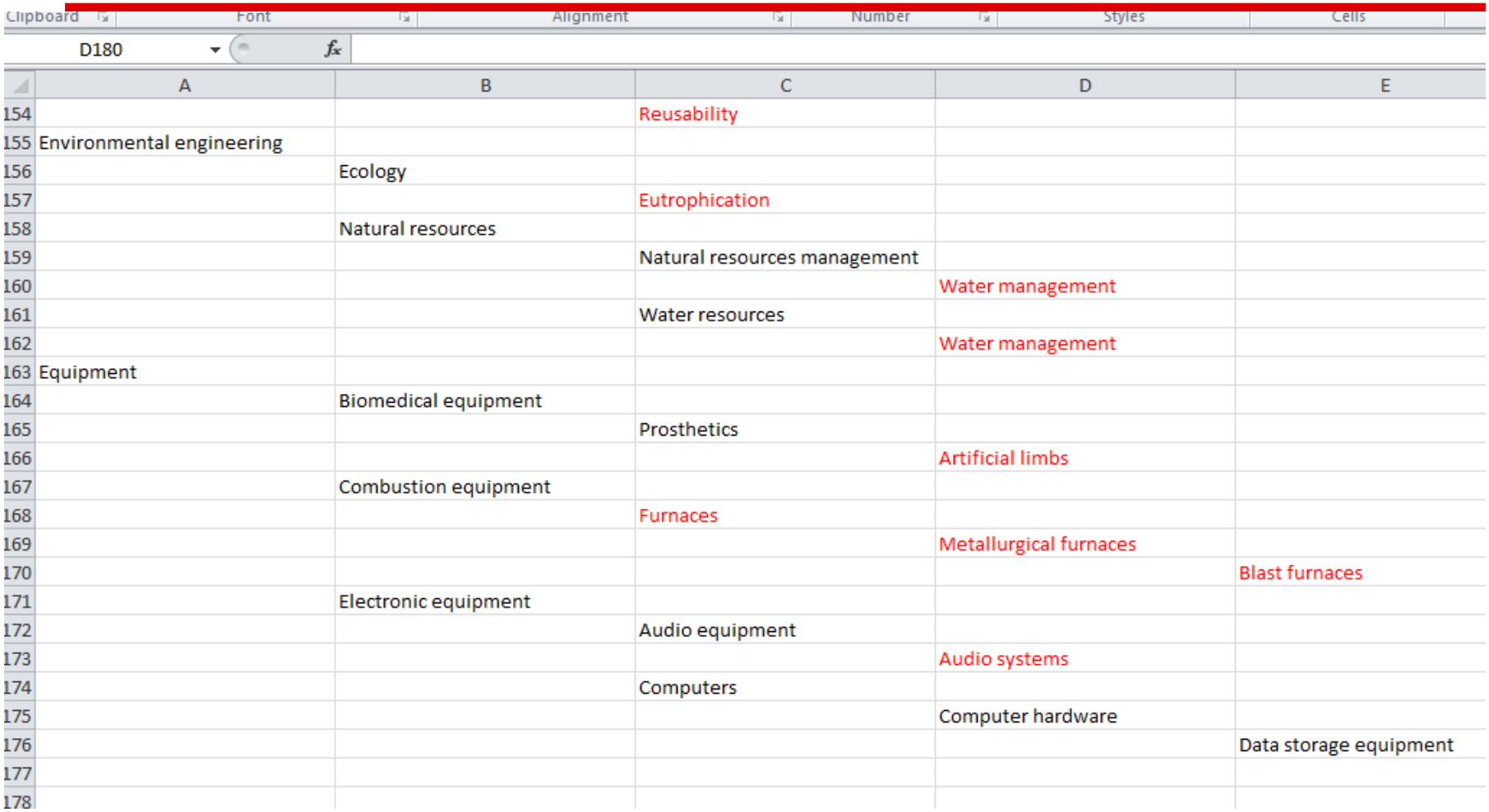
After de-duplicating, 162 unique Ei Controlled Terms and 37 Ei Main Headings identified.

# The Challenge - Visualization

- Equipment
  - Biomedical equipment
    - Prosthetics
      - Artificial limbs
  - Combustion equipment
    - Furnaces
      - Metallurgical furnaces
        - Blast furnaces
  - Electronic equipment
    - Audio equipment
      - Audio systems
    - Computers
      - Computer hardware
        - Data storage equipment
          - Digital storage
            - Virtual storage
      - Computer systems
        - Distributed computer systems
          - Multiprocessing systems
            - Parallel processing systems
              - Parallel architectures
        - Real time systems

This is an indented hierarchy visualization using Word

# Visualization - another example



Clipboard | Font | Alignment | Number | Styles | Cells

D180 $f_x$

| | A | B | C | D | E |
|---|---|---|---|---|---|
| 154 | | | Reusability | | |
| 155 | Environmental engineering | | | | |
| 156 | | Ecology | | | |
| 157 | | | Eutrophication | | |
| 158 | | Natural resources | | | |
| 159 | | | Natural resources management | | |
| 160 | | | | Water management | |
| 161 | | | Water resources | | |
| 162 | | | | Water management | |
| 163 | Equipment | | | | |
| 164 | | Biomedical equipment | | | |
| 165 | | | Prosthetics | | |
| 166 | | | | Artificial limbs | |
| 167 | | Combustion equipment | | | |
| 168 | | | Furnaces | | |
| 169 | | | | Metallurgical furnaces | |
| 170 | | | | | Blast furnaces |
| 171 | | Electronic equipment | | | |
| 172 | | | Audio equipment | | |
| 173 | | | | Audio systems | |
| 174 | | | Computers | | |
| 175 | | | | Computer hardware | |
| 176 | | | | | Data storage equipment |
| 177 | | | | | |
| 178 | | | | | |

# Why?

Goal is to have a way to visualize the research output/activity of the faculty. This has several benefits:

- Enabling liaison to better tailor services.
- Educating liaison to utilize more precise search strategies.
- Facilitating liaison and library in identifying potential collaborations across departments by mapping of terms between research programs (may be automated by Faculty Accomplishment System / VIVO)
- Create a document useful to non-specialist librarians and as a learning tool for new specialist librarians.

# Reason for Healthy Skepticism

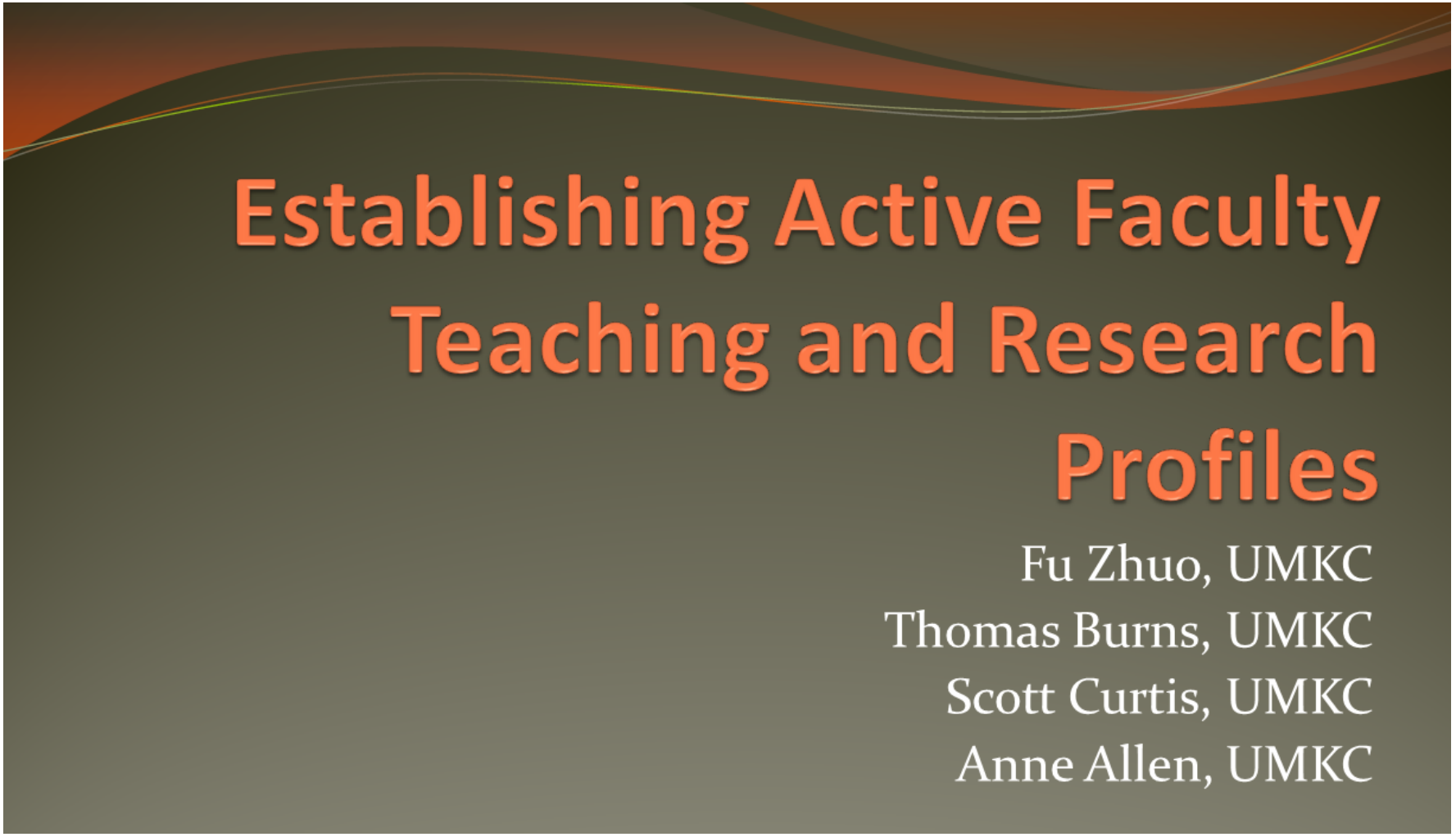
Metacrap (links to the 2001 essay / screed / manifesto by Cory Doctorow; worth reading for any info. pro.)

Specifically, these points apply

- 2.2 People are lazy
- 2.3 People are stupid
- 2.5 Schemas (thesauri) aren't natural
- 2.7 There's more than one way to describe something

Leading to....GIGO (garbage in / garbage out)

# Collaboration with Colleagues



# Questions/Comments?

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