

# Contest: Measuring Tech Emergence

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## GOALS

- TO DEVELOP NEW **EMERGENCE INDICATORS** TO SUPPORT RESEARCHERS, RESEARCH MANAGERS, BUSINESSES, AND OTHERS IN IDENTIFYING **EMERGING TOPICS WITHIN A SCIENCE AND TECHNOLOGY DOMAIN.**

## APPROACH

- WE TAKE A **MICRO** APPROACH (SEE CARLEY ET AL., 2018; PORTER ET AL., 2018)
- [CONTRAST TO A COMPLEMENTARY **MACRO** APPROACH (SEE SMALL, BOYACK & KLAVANS, 2014)]

## OUR R&D EMERGENCE INDICATORS CRITERIA

- TERM **NOVELTY**
- TERM **PERSISTENCE**
- RESEARCH COMMUNITY** FORMATION
- TERM **GROWTH**

**EMERGENCE INDICATOR ILLUSTRATIONS FOR “NANOTECHNOLOGY” – SEE FIGURES 1 & 2; & FOR 2 NANO TOPICS – DOX RELEASE AND GQDS IN FIGURE 3**

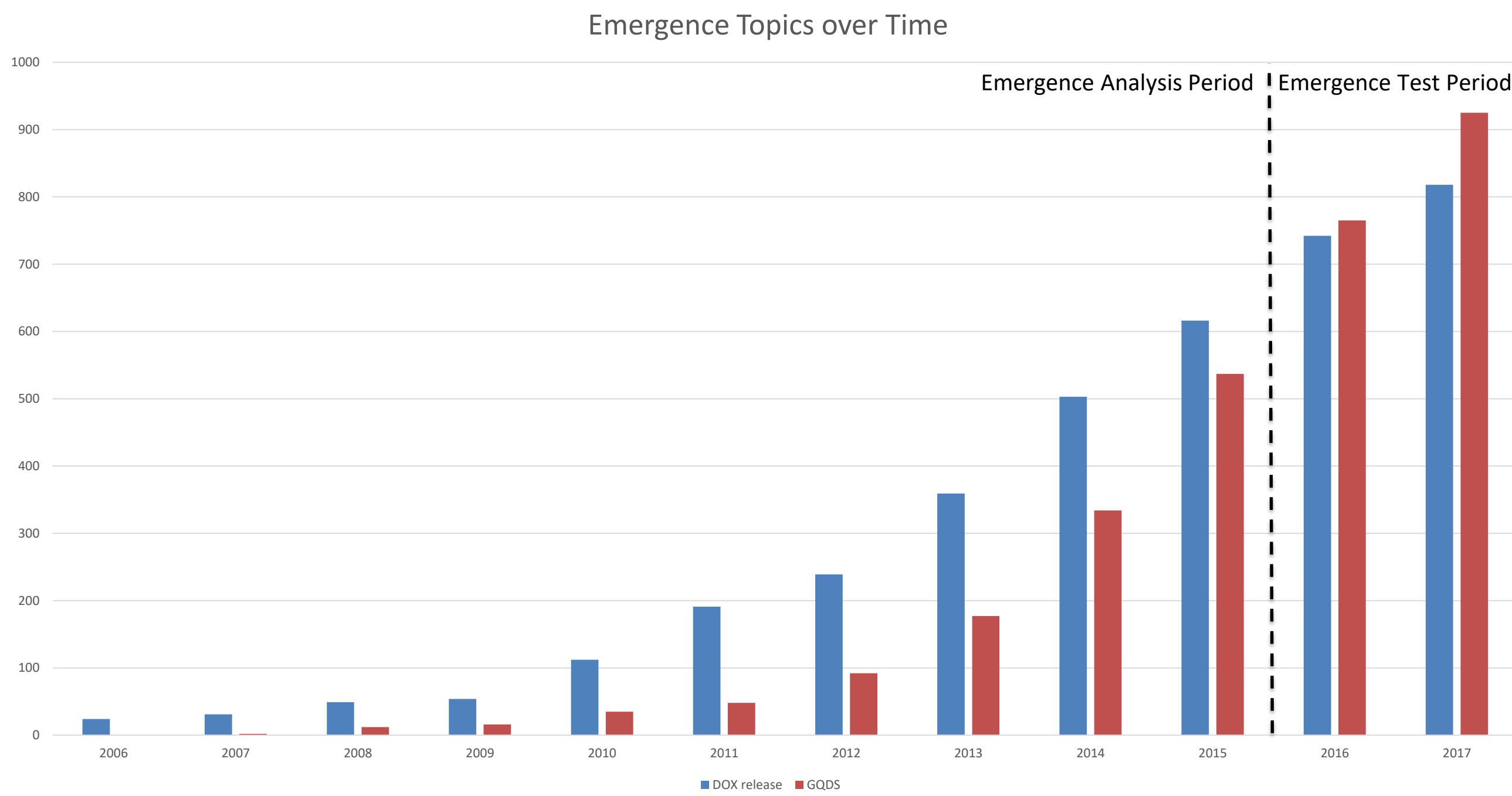
## THE CONTEST: A CHALLENGE

- OUR APPROACH SERVES AS A **BASE MODEL FOR COMPARISON.**
- OUR CHALLENGE INCENTIVIZES THE **DEVELOPMENT OF NEW AND BETTER APPROACHES** TO DEVISE INDICATORS OF EMERGING R&D TOPICS.
- GROUND RULES (BEING FINALIZED):
  - (FREE) ACCESS TO HIGH QUALITY DATASETS ON WHICH TO TRAIN & EXPERIMENT – ABSTRACT RECORDS ON 3 TOPICS FROM A GLOBAL R&D DATABASE (WEB OF SCIENCE) (~JAN. 1, 2019)
  - COMPETITORS RECEIVE THE TEST DATASET & SUBMIT THEIR RESULTS FOR ASSESSMENT WITHIN ~10 DAYS (~APRIL)
  - WINNER TO BE AWARDED FOR THE 2019 GLOBAL TECHMINING CONFERENCE (OCT. 11, ATLANTA, GA USA) (COMPLIMENTARY REGISTRATION AND TRAVEL SUPPORT UP TO \$1500)
- STUDENT AND/OR ACADEMIC RESEARCH GROUPS** ESPECIALLY ENCOURAGED TO PARTICIPATE. PARTICIPATION IS **OPEN TO ALL.**
- TO RECEIVE CONTEST UPDATES SEND YOUR E-MAIL ADDRESS TO: [STEPHEN.CARLEY@SEARCHTECH.COM](mailto:STEPHEN.CARLEY@SEARCHTECH.COM)

Fig 2. Indicators of Technology Emergence in Nanotechnology

1991-2000 High Emergence Terms	Emergence Scores	1998-2007 Emergence Scores	Emergence Scores	2006-2015 High Emergence Terms	Emergence Scores
atomic force microscopy	23.68	nanoparticles	63.10	Graphene	55.41
atomic force microscopy (AFM)	20.53	nanowires	20.04	g(-1)	48.15
nanoparticles	19.81	gold nanoparticles	19.97	great potential	42.13
carbon nanotubes	17.85	field emission	18.92	graphene oxide (GO)	32.28
x-ray diffraction (XRD)	15.48	CNTs	17.89	synergistic effect	31.97
mechanical properties	13.10	carbon nanotubes (CNTs)	17.85	electrochemical performance	31.59
particle size	12.37	detection limit	17.52	visible light irradiation	24.93
nanotubes	11.90	nanocomposites	16.66	cancer cells	24.85

Fig 3. Emergence Topics over Time



Check the Contest Website for further information:

<http://www.vpinstitute.org/wordpress/academic-portal/tech-emergence-contest/>

## REFERENCES

- STEPHEN CARLEY, NILS NEWMAN, ALAN PORTER, & JON GARNER (2018). AN INDICATOR OF TECHNICAL EMERGENCE, *SCIENTOMETRICS*. 115 (1), 35-49; [HTTP://LINK.SPRINGER.COM/ARTICLE/10.1007/s11192-018-2654-5](http://link.springer.com/article/10.1007/s11192-018-2654-5).
- ALAN PORTER, JON GARNER, NILS NEWMAN, STEPHEN CARLEY, JAN YOUTIE, SEOKBEOM KWON & YIN LI (2018) NATIONAL NANOTECHNOLOGY RESEARCH PROMINENCE, *TECHNOLOGY ANALYSIS & STRATEGIC MANAGEMENT*, DOI: 10.1080/09537325.2018.1480013.
- HENRY SMALL, KEVIN BOYACK, & RICHARD KLAVANS (2014). IDENTIFYING EMERGING TOPICS IN SCIENCE AND TECHNOLOGY, *RESEARCH POLICY*, 43 (8), 1450–1467.

## ACKNOWLEDGEMENTS

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Fig 1. Initial stage – distinguish terms that evidence accelerating recent R&D attention. Dataset: Nanotechnology (Web of Science, 2006-2015).

