Research Ideas - 2017

I am adding seven (new) entries to a research idea brainstorming list each week, over the course of 2017. Each block of research ideas are organized according to a month-week structure. Where a week overlaps between months, if the week is the fourth in the ending month the list update belongs to that month. Otherwise, the overlap serves as the first week in the beginning month.

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Thus, I encourage you to use these ideas as springboards for your own research. Quote, mix & match, revise. . . do whatever you feel inspired to do with the entries. I do ask that if a list entry is *italicized*, please do not use that exact entry in your work. An italicized entry means that I am using the idea.

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January

Week 1

To what extent do cybersecurity course objectives in higher education correlate with cybersecurity job openings?

How strongly does visible trends in cybersecurity topics correlate with publishing trends? As well, what degree of academic literature is read?

Why is the negative minority of players more vocal than the positive majority?

What are the most common categories in cyber security jeopardy competitions? Are there common questions?

Do seminal studies in cyber security lab literature experience significant replication? To what extent are quantitative results validated?

Does completing homework produce a statistically significant increase in academic performance?

Why do we need to define a rule against violence/harm for AI (e.g. Asimov's 3rd Law).

Week 2

To what extent do subjects with no less than five years experience programming display a different linguistic reality than subjects who have never programmed?

Does social media produce an operant panopticism and sense of action being over-scrutinized (and, thus, narcissism)?

What does it mean to 'learn'?

What tools exist to objectively measure learning?

To what degree does number of lines of code in an open source project correlate with the number of contributors?

What is the half life of open source contributors (i.e., how long does it a take for a contributor to fall off in the number of contributions)?

Why is feature parity the basis of comparison between FOSS software and proprietary software with 'freedom' not being included?

Week 3

What are the characteristics of a 'good' question?

To what extent do multiple academic performance measures converge on the same outcome given identical input?

Why is academic procrastination seemingly a part of "student friendly" undergraduate teaching?

Will artificial general intelligence evolve biomimetic behavior?

Does a rising trend in user accounts give rise to malicious activity?

Can we use response rates as input to genetic computation of 'better' SPAM?

What is the relationship between account creation and receiving account targeted SPAM or phishing email?

Week 4

Does knowing how the (human) brain works physiologically tell us how consciousness works?

Is the difference between a conscious mind and an unconscious mind the amount of (hidden) layers substrating propagation of neural impulses?

Will machine consciousness have the same idea of individuality as primate consciousness?

Is the probability of corruption in an arbitrary sequence of input computationally knowable?

Is there a significant difference between the efficacy of self-study compared to guided study?

Is there a significant difference between the efficacy of synchronous distance learning that includes audio-video of instructor compared to audio only?

What are the necessary components of a conceptual framework for post-transhumanist trust?

February

Week 1

Is the risk of executing untrusted code obviated by robust egress network filtering?

What percentage of publicly accessible source code requires a legacy compiler (version) to build?

What differentiates popular open source projects from lesser know but equally 'usable' projects?

At what rate do users search for open source alternatives to commercial software?

Are programming language syntax, semantics, and idioms stored and retrieved from declarative memory or motor memory?

How does variable programming study compare to focused study in learning a first programming language?

To what extent will machine consciousness experience cultural evolution of language?

Week 2

Will machine consciousness adhere to the logic, grammar, and rhetoric principles (i.e, the Trivium) found in human consciousness?

To what extent are the 'logic' and 'grammar' principles of the Trivium present in computational model of the mind?

To what extent is the Trivium an effective model for the expression of internal computational problem solving?

What are the common perceptions of authentication as an assertion of biological identity?

Can a neural network be trained to differentiate between malicious access to a file system object compared to normal access to the same file system object?

How does the CPU usage profile of a virus that infects a particular file system object?

Does a keylogger produce a measurable ghost pattern as a user types?

Week 3

Can programmer skill be measured according to what extent solutions to a given type of problem (e.g., search, sort, etc.) are expressed with a richer semantic basis?

What are the pedagogical qualities that comprise a 'hard' (rigorous) undergraduate course?

How does cybersecurity research incorporate 'human factors' (as defined by Stramler 1973) into empirical investigation of user behavior?

What elements should be included in a conceptual framework for assuring confidentiality in synthetic cellular communication signaling?

How effective is completing a 'hard' programming challenge in entirety compared to punctuated experience across multiple 'Easy' programming challenges?

To what degree does Meyers-Briggs personality type correlate with doctoral student performance in designing research?

What is the optimal frequency of laboratory exercise intervention on the learning experience compared to pre-defined KSA units?

Week 4

What epistemic propositions will artificial general intelligence develop in the context of technologically mediated Trust?

In what way(s) will artificial general intelligence generate social epistemic propositions for mediated Trust boundaries with non-AGI entities?

To what degree will a synthetic intelligence be able to articulate an epistemological rationale for trusting its knowledge?

To what degree will a synthetic intelligence be able to engage in mediated social epistemology?

How will a synthetic intelligence describe its own epistemology (e.g. Externalism vs. Internalism)?

What mechanisms will a synthetic intelligence develop to assure integrity of environmental stimuli?

To what extent will synthetic intelligence develop personality archetype(s) outside of the existing spectrum?

March

Week 1

What are time management (productivity) best practices for minimizing distraction and maximizing output?

How does multitasking influence time management (productivity) throughput and cognitive load?

What is the relationship between multitasking and cognitive fatigue?

Is there an optimal task (or type of task) to schedule during pomodoro interval breaks?

What factors have a validated, positive effect on productivity throughput?

To what extent does technology have an effect on multitasking throughput and cognitive load?

What validated determinants exist for the objective measurement of task throughput and cognitive load?

Week 2

Does time of day wake up preference affect task productivity?

Is there a specific genetic polymorphism or polymorphisms associated with shortened sleep cycles yielding restorative effects?

To what extent do polyphasic sleep cycles have a positive effect on task productivity compared to monophasic sleep?

What is the optimal time of day wake period for creative task productivity?

Does a validated protocol exist for measuring the minimal amount of sleep necessary to maintain maximum task performance?

How does polyphasic sleep cycling compare to transcranial direct-current stimulation for increasing task performance?

What are the early warning cognitive expressions of sleep debt?

Week 3

Are there any biological signaling mechanisms that have evolved to prevent eavesdropping?

What are common characteristics of biological organism authentication?

How do single-cell organisms identify environmental threats?

What simple rules do individual bacterium follow when avoiding (evading) threats such as bacteriophages?

How do simple multicellular organisms detect duplicated chemical signals?

What is the maximum information threshold present in single cell organism chemical communication pathways?

What are the performance differences between digital communication pathways (e.g. copper, fiber optic, etc.) and biological signal transduction?

Week 4

What are the characteristics of a competent research mentor?

To what extent are the desirable traits of research mentors present in subjects across departmental boundaries?

What are validated quantitative measures of research design competency?

To what degree do various quantitative measures of research competency converge to identical values?

To what extent is there a measurable difference between single competency examination compared to multi-phased examination?

How can professor and student competencies be combined to maximize learning?

What are residency curricular best practices in evaluating faculty research competencies?

April

Week 1

What is an effective assessment schedule for semester length undergraduate computer science courses to maximize learning?

To what extent are more frequent but smaller in scope examinations effective at maximizing learning compared less frequent but larger in scope examinations?

How do undergraduate students perceive flexible 'contract grading' curricula compared to traditional curricular scheduling of weekly homework, midterm examination, and final examination?

Week 2

What is the potential increase in game wins by Twitch.tv streamers with large subscriber bases compared to those with smaller subscriber bases?

How does crowdsourcing of game mechanics details (e.g. looting) to a subscriber base influence the win rate of Twitch.tv streamers?

To what extent is there a cognitive offload associated with a play performance increase for Twitch.tv streamers that have interactive subscribers?

Week 3

Week 4

To what degree do cognitive tasks associated with common cybersecurity tool use (e.g. Nmap) produce unique EEG patterns?

Can a non-invasive brain-computer interface be used to operate common cybersecurity tools (e.g. Nmap)?

May

Week 1

What is the psychological effect of calling an activity a 'game' compared to a 'competition'?

To what degree does citation count correlate with quality of published research within the citation list?

What is a sufficiently large citation count to be perceived as being a source of learning?

Week 2

How can bidirectional knowledge trust be measured in an artificial intelligence tutoring system?

Why has pedagogical theory evolved over time to be less objectivist and more constructionist?

To what extent does academic assessment have a positive effect on in-class student performance?

How will an artificial intelligence tutor express an epistemology for *knowing* a concept versus an operation?

What effects do free MOOCs have on the instructional design of undergraduate computer science courses?

What are information systems student perceptions of free, online knowledge (e.g., MOOCs, YouTube, MIT Open Courseware) compared to the courses those students complete as part of their degree program?

Week 3

How do game engine mechanisms co-evolve alongside gaming community preferences for game features?

How effective are game AI agents in teaching players game rules while serving as an opponent?

What characteristics of a game AI agent contribute to player perception of difficulty?

What game AI agent attributes contribute to the player perception of life-like behavior?

How do players experience knowledge trust when interacting with autonomous game AI agents?

To what extent can an established game AI agent be used to train a new AI agent? Are behaviors identically reproduced?

How are game AI agents able to express internal knowledge of learned behaviors?

Week 4

What are the most common features associated with word processor files intended to be future-proof readable?

What is the mean lifetime for word processor applications between file format change?

How does a word processing system preserve semantic meaning across file format evolutions?

To what extent are (plain) text files more resistant to data degradation than word processor generated files?

What is a validated measure of *mean* time of data degradation in text files? Does the mean time vary by storage media?

What is the relationship between word processor software decay and data degradation of the files generated by the software?

To what extent do frequently accessed text files incur data degradation compared to infrequently access text files?

June

Week 1

What is an optimal pedagogical framework for teaching undergraduate mathematics in a synchronous online computer science program?

How are students most effectively incentivized to complete homework assignments in a synchronous online undergraduate mathematics course?

Do students perceive online synchronous mathematics courses to be as effective as traditional on-campus courses?

What is an optimal number of homework assignments in an online synchronous mathematics course, including the number of questions per assignment?

To what degree is game-based learning an effective pedagogy for advanced mathematics instruction?

What features would a game engine need to be used as a situated learning platform for teaching advanced mathematics?

To what extent do students use syllabus defined learning outcomes to measure self-efficacy in learning during undergraduate coursework?

Week 2

What are the differences in how students perceive volume of homework assignments in an online synchronous course compared to a traditional on-campus course?

How do students perception of self-efficacy in discrete mathematics homework assignments compare to actual grades on the same assignments?

What are pedagogical best practices for maximizing in-class participation by undergraduate computer science students?

To what extent can undergraduate mathematics be effectively taught using a situated learning pedagogy?

What are the instructional design differences (e.g. assignments, lectures, etc.) between undergraduate and graduate same subject mathematics courses?
What are validated, non-traditional pedagogies for teaching programming to undergraduate students?

What are best practices for structuring assignments from the perspective of undergraduate computer science students?

Week 3

What is the optimal game type for teaching graduate level quantitative data analysis?

What are the most common learning outcomes as indicated in graduate level quantitative data analysis syllabi?

To what degree do graduate students prefer to generate primary data in a case study based quantitative data analysis course compared to using secondary data?

How do working professional graduate students perceive game-based case studies in a quantitative data analysis course?

What are common issues encountered by graduate students in a quantitative data analysis course that uses game-based case method instruction?

What quantitative data analysis topics are appropriate for case study based graduate course?

What are appropriate academic assessment measures for an online, case method driven graduate quantitative data analysis course?
Week 4 *What are the publishing trends in gamification of computer science undergraduate education in the United States?*

To what extent is game theorycrafting used to teach undergraduate students research methods?

How has the amount of published research using World of Warcraft as the primary research context varied alongside subscription numbers?

What player behaviors (e.g., movement, cooperation, weapon choices, cover use, open camping) in action battle royal type games most often lead to victory?

What player behaviors are perceived as ethical violations within the virtual world of action battle royal games?

To what extent are there ethnological differences between PvE-centric MMORPG players and PvP action battle royal players?

To what degree does theorycrafting in PvE-centric MMORPG games influence the behavior of casual players?

July

Week 1

How does the perception of information permanency vary across demographic categories?

To what degree are some categories of personal information more permanent than others?

What difference exists between perception of personal information permanency compared to the permanency of information generated by others

To what extent do we perceive personal information to be revisable but others' information to be permanent?

How do users perceive information trust related to autonomous computing systems?

To what extent are users aware of technology as a knowledge mediator in socially constructed knowledge?

What variance exists between demographic categories in the view of technology as a mediator of socially constructed knowledge?

Week 2

To what extent are cybersecurity undergraduate students more likely to conform to group ethical decisions compared to graduate students?

Are undergraduate cybersecurity students more or less likely to object to an authority asking them to commit a harmful computing act than non-cybersecurity students?

What are the prominent ethical theoretical frameworks in cybersecurity pedagogical literature?

To what extent do undergraduate cybersecurity degree programs require coursework in critical thinking and ethics?

What pedagogy or pedagogies have a statistically significant effectiveness in teaching secure coding?

To what extent is there a measurable difference between undergraduate students that analyze code for security vulnerabilities and undergraduate students that develop patches for pre-defined vulnerabilities in code?

How does cognitive bandwidth capacity correlate with undergraduate students' selection of degree major and extracurricular activities?

Week 3

To what extent does absence of vocational education in cybersecurity contribute to the increasing workforce labor gap?

How can the growth of employment opportunities within field of cybersecurity be described according to taxonomic constructs?

What advantages would vocational education in cybersecurity hold compared to academic education in the same topic?

How can the necessary entry-level skills for entering the cybersecurity workforce be described in a dependency chart and what is the associated optimal build order?

To what extent does cybersecurity skill development depend upon ultimate vocational goal?

What decision-making processes are used by undergraduate STEM program students to determine their first vocation?

How common is lateral job movement between specialties within the cybersecurity profession?

Week 4

How do undergraduate faculty determine an optimal pedagogy for cybersecurity coursework?

To what extent are adjunct faculty aware of prominent cognitive learning theories?

What factors do adjunct undergraduate faculty in a cybersecurity degree program consider when designing a new course?

To what degree are undergraduate cybersecurity curricula consistent with the classical framework of an *academy*?

To what extent are *grammar, logic, and rhetoric* present in established Community of Practice disciplines compared to cybersecurity?
How can the lower division of the Liberal Arts be mapped to modern STEM academic curricula?

What are common learning outcomes for an undergraduate cybersecurity curriculum as defined by existing professionals?

Week 5

What are the common theories of ethics emergent in cybersecurity education literature?

What challenges do full-time cybersecurity faculty face in distance education?

To what extent is there a difference in student academic performance in undergraduate cybersecurity degree programs between distance, hybrid, and on-campus education settings?

What are the potential differences between the spirit of degree outcomes in a master of science degree in cybersecurity program compared to the realized degree outcomes?

How has the intent of graduate academics in STEM evolved over the past two decades?

To what extent are the determinants for matriculating into a cybersecurity four year degree program aligned with the broader determinants measured by Montmarquette et al. (2002)?

How does selection of major area of study correlate with academic performance in private four year institutions?

August

Week 1

Do Android vulnerabilities potentially vary with released feature changes?

How does OWASP top ten potentially vary with trends in developer application stacks?

To what extent can exploits of software vulnerabilities be detected through energy consumption?

How does detection of energy consumption patterns in an exploit of client software compare to a similar exploit in an equivalent web-based application (e.g. Word compared to Office 365 Word)?

Does the perception of vulnerability significantly differ between programmers using unmanaged languages (C, C++) compared to programmers using managed languages (e.g. C#, Java)?

Do programmers perceive programming languages to be insecure or the implementation of the language (e.g. compiler)?

To what extent can evolutionary biology inform the understanding of why secure coding *awareness training* does not appear to be effective?

Week 2

To what extent can monitoring of EEG patterns differentiate between natural neurotranmissions and synthetic neurotranmissions?

To what degree can EEG signals be captured and replayed such that a brain-computer interface action is replicable?

What does a threat model for non-invasive brain-computer interface look like?

What safety and trust issues exist for non-intrusive brain-computer interfaces between the wearer and device & vice-versa?

To what extent can input from a traditional physical peripheral (e.g. keyboard, mouse) be computationally differentiated from input from a non-intrusive brain-computer interface?

What is the operational input maximal limit from a non-invasive brain-computer interface to software with robust command-line options?

How can software be developed such that UI features, menu configurations, and feedback adapt to user mental state as measured through non-invasive brain-computer interface?

Week 3

How is the methodology of constructing an ontology potentially related to a progressive Trivium model?

To what extent does (simulated) environment inform development of ontologies?

What are the necessary components to construct a mutually understandable ontology in a given domain?

To what degree are object-oriented software design principles related to ontology construction principles?

Is there a significant difference between ontology construction steps and iterative research processes inherent to grounded theory design?

What are common limitations associated with ontology construction?

What are common error points in ontology construction methodology?

Week 4

What are the common differences and similarities between an ontology and a taxonomy?

How does a taxonomy extend an establish ontology?

Does an epistemology exist prior to constructing an ontology or come to exist as the ontology is situated into a context such as a taxonomy?

To what extent is construction of an ontology limited by the frame problem?

What are the common differences and similarities between a taxonomy and a folksonomy?

How does the mean time for *tag* evolution in a folksonomy compare to the mean time for *descriptor* evolution in a taxonomy?

Which construct has a shorter mean lifespan: taxonomy, folksonomy, or ontology?

Week 5

What is the optimal strategy for determining search keywords when conducting literature review?

To what extent do readers of academic research rate those studies with high keyword density and consistency in fundamental statements higher than studies with lower keyword density in the same statements?

What is the mean number of iterations (changes) to research problem statements made by doctoral students?

Do higher rated research statements (i.e., problem, purpose, research question) undergo a significantly higher number of modifications before publication than similar statements with lower ratings?

To what extent do declared keywords appear more frequently in higher rated cybersecurity research literature compared to lower rated literature?

Is there a statistically significant mean difference between Flesh-Kincaid readability scores in cybersecurity research literature with a higher impact factor than literature with a lower impact factor?

Are there common decision-making strategies employed by doctoral students to determine the appropriate research method and research design for their dissertation?

September

Week 1

To what extent is the EEG pattern different between non-invasive brain-computer interface wearers when executing the same brain speller exercise?

How do community college students perceive the cybersecurity risks associated with non-invasive brain-computer interfaces?

Which phase of non-invasive brain-computer interface has a measurably higher quantitative risk - signal acquisition, feature extraction, feature translations, or control signaling?

What features would be necessary in a secure containment field for brain-computer interface signal acquisition and feedback channels?

To what extent is a non-invasive brain-computer interface able to control a cybersecurity software tool compared to a traditional interface with training equivalent?

To what extent can a non-invasive brain-computer EEG headset be used in conjunction with a modified intrusion detection graphical interface to decrease type I and type II error rates in human operators?

How similar are EEG patterns between undergraduate students completing a port scanning cybersecurity laboratory exercise and undergraduate students listening to a cybersecurity lecture on port scanning?

Week 2

How do undergraduate students perceive academic research opportunities compared to graduate students?

What are best practices in soliciting undergraduate student participation in writing and publishing academic research?

What is the mean time for a STEM field related academic journal to reach an impact factor perceived to be legitimate by researchers?

What are the top twenty keywords appearing in cybersecurity-related journal call-for-papers?

To what extent are hybrid or online-only conferences trending positive in STEM fields?

What are the common factors that lead students to not participants in academic research opportunities?

What are the potential incentives offered to undergraduate STEM majors that lead to a sustained research and publication engagement?

Week 3

What pedagogical strategies are most commonly used in teaching cybersecurity matched concept and tools (e.g. port scanning and nmap)?

To what extent do undergraduate students with non-cybersecurity majors perceive the pedagogy of laboratory exercises differently than cybersecurity majors?

To what degree do undergraduate cybersecurity students rate traditional lecture with standard assignments, lecture with lab assignments, and flipped lab and lecture, in a statistically significant different manner?

How do students perceive pre-recorded lectures compared to traditional lectures in STEM majors?

Is there a statistically significant difference in student academic performance between a traditional cybersecurity course, the same course taught hybrid on-campus and online, and the same course taught online only?

Is there a statistically significant difference in student academic performance between an online asynchronous cybersecurity course and the same course taught synchronously?

What are the potential perceptional differences between undergraduate cybersecurity students with learning cybersecurity theory only, cybersecurity theory coupled with applied tools, and applied tools only?

Week 4

To what extent is there a quantifiable relationship between the time necessary to make a programmatic change (i.e., bug fix) and the time to QA test the change?

Is there a statistically significant difference between the incidences of common types of memory management software defects in open source C programs?

Is there a statistically significant difference between the incidences of integer-based security flaws, string-based security flaws, and memory management based security flaws in open source C programs?

How do undergraduate computer science students perceive secure coding best practices?

To what degree do computer science undergraduate students and cybersecurity undegraduate students describe the purpose of *software* differently?

To what extent are computer science students able to describe common C compiler (gcc) hardening flags?
What are the potential differences in perception of software between a general C programmer and C programmer cognizant of common security flaws?

October

Week 1

What elements are considered best practices for academic writing plans by authoritative references in research pedagogy?

To what extent are doctoral students that use writing plans more successful in authoring a dissertation than doctoral students that do no use writing plans?

What effect does a visual cue (i.e., screen darkening) have on writing efficiency when the cue is triggered by focus distraction?
Is there a specific visual cue that most effectively resets focus during writing?

What are some common, measurable behavioral cues that signify that focus is drifting during writing?

What are common behavioral cues- measurable through eye movement, facial muscle tick, and EEG pattern- that signify that focus is drifting during reading?

To what extent are behavioral cues usable as action triggers for specific phases of a writing plan (e.g., planning, outlining, writing proper, etc.)?

Week 2

How do undergraduate students perceive the use of lecture notes in computer science, mathematics, and cybersecurity courses compared to presentation slides?

What Flesch-Kincaid reading level for undergraduate lecture notes is perceived to be *informational* by students in STEM courses?

To what extent is there a different optimal quantity of example problems in lecture notes compared to lecture in an undergraduate discrete mathematics course?

How does the availability of bonus problem sets potentially influence student engagement during undergraduate discrete mathematics course?

What is the optimal point value of a bonus problem set in an undergraduate discrete mathematics course relative to the number of problems in the set?

What content, if any, do students find *most valuable* in undergraduate discrete mathematics lecture notes?

To what extent do undergraduate discrete mathematics students complete reading assignments when lecture notes are available compared to when lecture notes are not available?

Week 3

What information artifacts are residual to the use of GPU for security-based computing (e.g. IDS)?

What is the potential impact of transfer credit on time to completion for doctoral students?

To what extent is application essay Flesch-Kincaid readability a factor in time to completion in an online synchronous doctor of science program?

To what extent does mean time between Institutional Review Board approval and dissertation writing completion predict overall quality?

To what degree do application date compared to deadline, transfer credits, and SAT score correlate with mean first year undergraduate GPA?

What are potential common factors in doctoral student failure to complete the writing phase of the dissertation?

Do faculty or administration have a more significant impact on doctoral student completion?

Week 4

To what extent is there a long-tail phenomenon associated with academic literature?

How has the total number of academic journal articles grown in relationship to the number of doctoral degrees conferred annually in the United States?

To what degree has the publication of topic-level literature review changed in STEM fields over the past 5, 10, and 20 years?

To what extent are literature reviews in STEM cited more often than seminal literature in the same fields?

How do doctoral students describe the value and importance of published literature reviews to their selected dissertation topic?

What is the measured impact factor of published literature reviews compared to quantitative studies that demonstrate a positive effect in the selected phenomenon?

How do journal editors of STEM focused journals describe the value and importance of publishing literature reviews?

November

Week 1

What are the potential relationships in EEG patterns between programming and music composition?

To what extent is there a common music genre that programmers may be predisposed to favor?

In what ways do programmers and music composers display similar behavioral patterns?

Do programmers exhibit similar behavioral and neural patterns when listening to music compared to podcasts?

Is programming more similar to music composing or music conducting when measured through behavioral and neural activity?

How does music from different music genres that share common note and timing structures (e.g., jazz and technical death metal) produce similar neural markers in programmers?

What are the potential effects of self-selected music genre compared to externally selected music genre on programmer productivity?

Week 2

To what extent can an effective community of practice be developed through social media?

To what degree are STEM academics less active in social media than STEM professionals?

How do STEM academics perceive the value of social media as a means of developing research collaborations?

What are the most common criticisms of using social media as a community of practice platform amongst STEM academics?

What are the most effective modalities for developing a research focused community of practice in STEM?

To what extent do STEM academics engage in distance (virtual) conference participation?

How are virtual conferences perceived by STEM academics compared to traditional, non-virtual conferences?

Week 3

What functionality and features would be necessary to implement a stateful firewall type control within an EEG-based non-instrusive brain-machine interface?

To what degree is it possible to implement a firewall type control between the brain signal acquisition phase and the preprocessor in a non-intrusive brain-mechin interface?

How do participants describe the advantages and disadvantages of brain-computer interfaces for autonomic control of IoT devices?

What are common security and privacy concerns for non-intrusive brain-computer interfaces?

To what extent are participants willing to use brain-machine interfaces in lieu of traditional input mechanisms (e.g. keyboard, mouse)?

To what degree do users of non-intrusive brain-machine interfaces perceive the device as assistive, additiive, or externalized?

What are the possible modalities in which non-intrusive brain-machine interfaces exceed the scope of access to computing systems compared to traditional human-computer interaction?

Week 4

How do professional programmers describe the normative ethic of developing secure code?

Why is the apparent normative ethic in programming to *not* develop using secure coding principles?

To what extent do programmers consider societal impact of decisions to use unsafe versus safe functions?
Does the *right* of a program user imply the *duty* for a programmer to produce

secure code or does the *right* of the company to release software imply a *duty* for a programmer to simply produce code?

To what extent is there a measurable, culturally grounded difference in the production of secure code?

How do program users describe the ethics of secure code compared to programmers?

Do programmers perceive the ethics of secure coding as metaethics, normative, or applied?

To what extent is secure coding perceived as a universal duty ethic?

December

Week 1

To what extent can a multi-agent pathfinding algorithm optimize the collection of decentralized data objects in a mesh network topology?

How do artificial life agents *describe* a bounded confinement field when permitted to evolve environmental language?

What is the hardware resource threshold for the number of IoT devices whereby distributed computation is effective for communication pathway optimization within the same IoT network mesh?

To what extent is a ANN effective at real-time cybersecurity classification and prioritization for ingress traffic?

To what extent does existing artificial immune system research accurately describe mammalian immune system characteristics?

How would a synthetic intelligence describe an optimized semantic ontology for human-robot team communications?

What are common cognitive task delegation decision modalities for use in human-robot teaming?

Week 2

How do completion rates of doctoral students differ between traditional on-campus programs, distance asynchronous programs, and distance hybrid programs?

To what extent does the recruitment modality of doctoral student predict future success in a distance hybrid doctoral program?

Do doctoral students that possess a more robust *research lexicon* by the end of the first year in a doctoral program exhibit a higher completion rate compared to students lacking such a lexicon?

To what degree does periodic competency assessment of faculty relate to doctoral student completion rates?

What existing cognitive load measurements can be applied to distance hybrid doctoral students such that proactive interventions can be implemented?

How do distance hybrid doctoral students perceive a requirement to submit a research and writing plan as a precondition to candidacy?

Which factor is a significant predictor for the other: quality of faculty predicting student success or quality of students predicting competency in faculty?

Week 3

What elements of scientific peer review impart the notion of scholarly work unto research?

To what extent does crowdsourced review of written research function in the same manner as elective peer review (e.g., journal, conference)?

What is the social network density threshold whereby operationalized peer review of written research exceeds the quality in such review when performed through traditional modalities?

To what degree is crowdsourced review of scholarly writing able to more significantly measure research *significance* compared to traditional review modalities?

What would be the optimal bounded question instrument to solicit crowdsourced review of scholarly writing?

What ratio or balance between subject matter experts and non-subject matter experts would be ideal in a crowdsourced research peer review?

What would be the optimal algorithmic steps in a human-based genetic algorithm designed to crowdsource scientific peer review of written research?

Week 4

What is the decision making process for selecting and implementing a workflow productivity system?

What are the common factors between modern workflow productivity systems that lead to increases in personal productivity?

Are there identified elements in workflow productivity systems that stimulate dopamine pathways more optimally than other elements?

To what extent does physically writing a research article synthesis/summary produce a different EEG pattern than electronically typing?

Does writing a research article synthesis/summary while sitting produce a significantly different EEG pattern than writing whilst standing?

Can non-invasive brain-machine interfaces be operationalized to modulate productivity task focus such that types of tasks are dynamically introduced based on EEG state?

What are the common factors of workflow productivity systems employed by academics with an Author Impact Factor (h-index) of greater than 20 after 20 years?