The Cyber Meta-Reality and Cyber Microbiome

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Biographical Sketch

- Dr. Joshua Alton Sipper is currently assigned to the Air Force Cyber College as a Professor of Cyberwarfare Studies. He completed his Doctoral work at Trident University in September of 2012, earning a Ph.D. in Educational Leadership (emphasis, E-Learning Leadership). Dr. Sipper's previous degrees were obtained from Troy University (M.Ed. Education) and Faulkner University (B.S. English). Dr. Sipper is a veteran who served honorably in the U.S. Air Force in the intelligence career field, and worked for Lockheed Martin in a similar capacity on the U2 program. More recently, Dr. Sipper shifted his focus into the cyber realm as a Systems Engineer for General Dynamics at the Air Force's 26th Network Operations Squadron, followed by an eight-year stint as a civil servant in the Air Force cyber career field at the Curtis E. LeMay Center for Doctrine Development and Education. Dr. Sipper currently serves as a Professor of Cyber Warfare Studies at the Air Force Cyber College, Air War College, Air University, Maxwell AFB. Dr. Sipper's research interests include cyber ISR, policy, strategy, and warfare.

The Cyber Meta-Reality and Cyber Microbiome

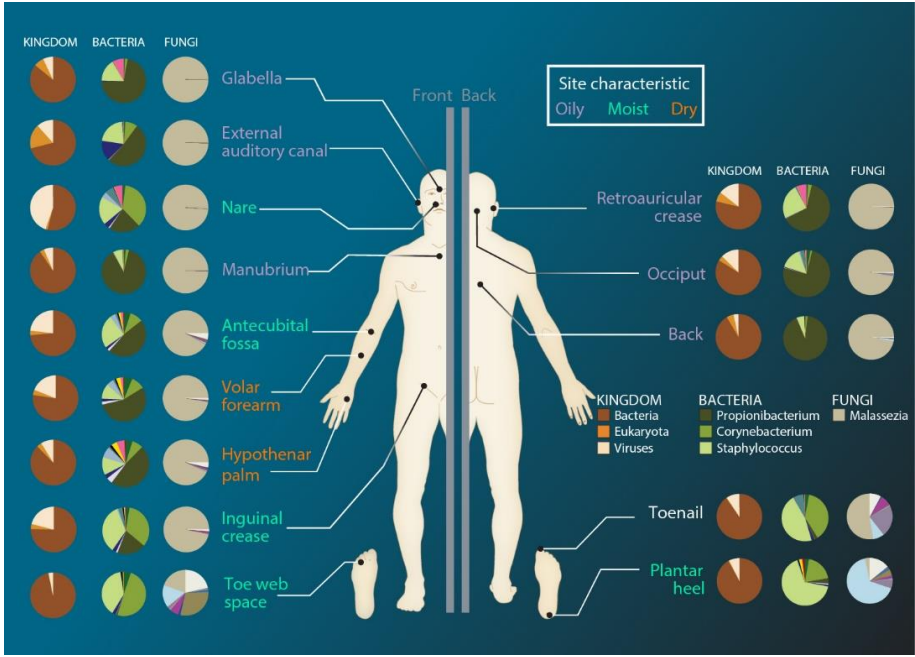
- Defining the Cyber Meta-Reality
- Defining the Cyber Microbiome
- Cyber Threat Intelligence within the Cyber Meta-Reality and Cyber Microbiome

Defining the Cyber Meta-Reality

- A reality about and formed from other realities
- Gaming realities, research realities, family realities, and the darker realities like pornography and cheating Websites, the *cyber meta-reality* (right) continues to grow and deepen, offering escapes, adventures, and myriad resources
- To understanding how species are formed, exist, change, and proliferate within a system you must understand the system or medium they inhabit

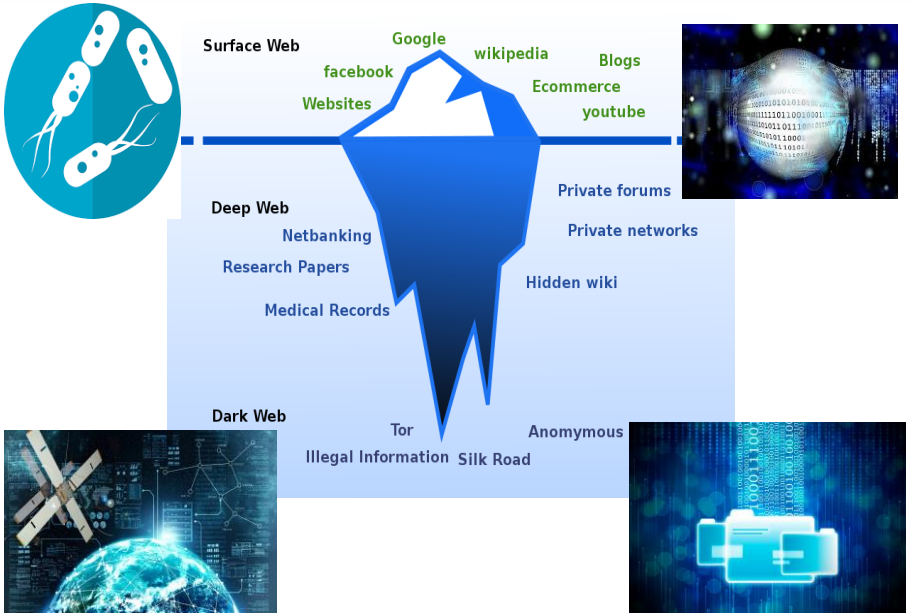
Defining the Cyber Microbiome

- First, understand the microbiome; human and terrestrial
- Concept first broached by Macarthur (1955), then expanded by Savage (1977) "…bacterial cells likely outnumber human cells by at least an order of magnitude." Later expanded to several orders of magnitude (Fierier, et. al., 2012)
- As our bodies and even the planet on which we live are mostly microbiome, so too is the Cyber Meta-Reality

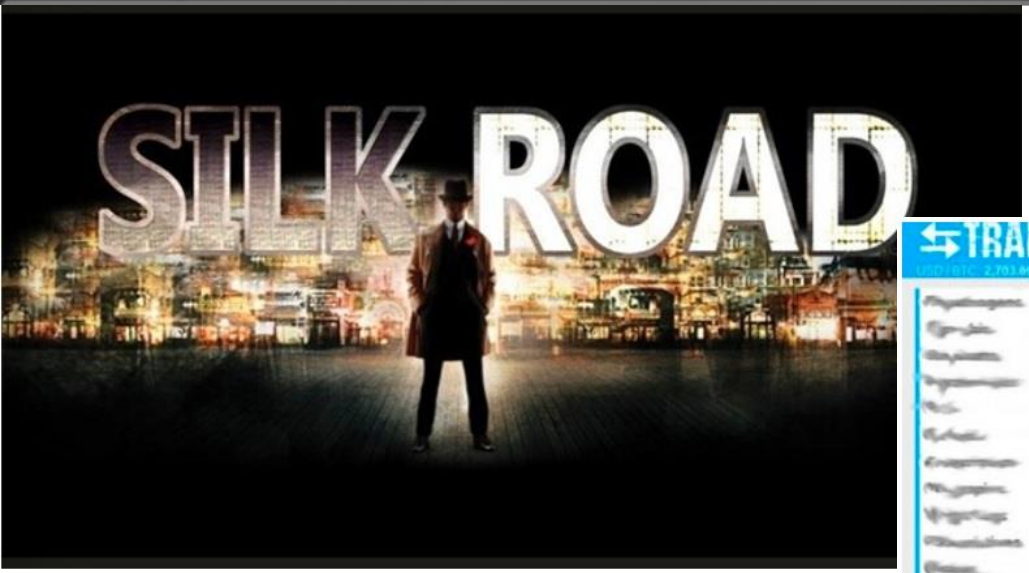


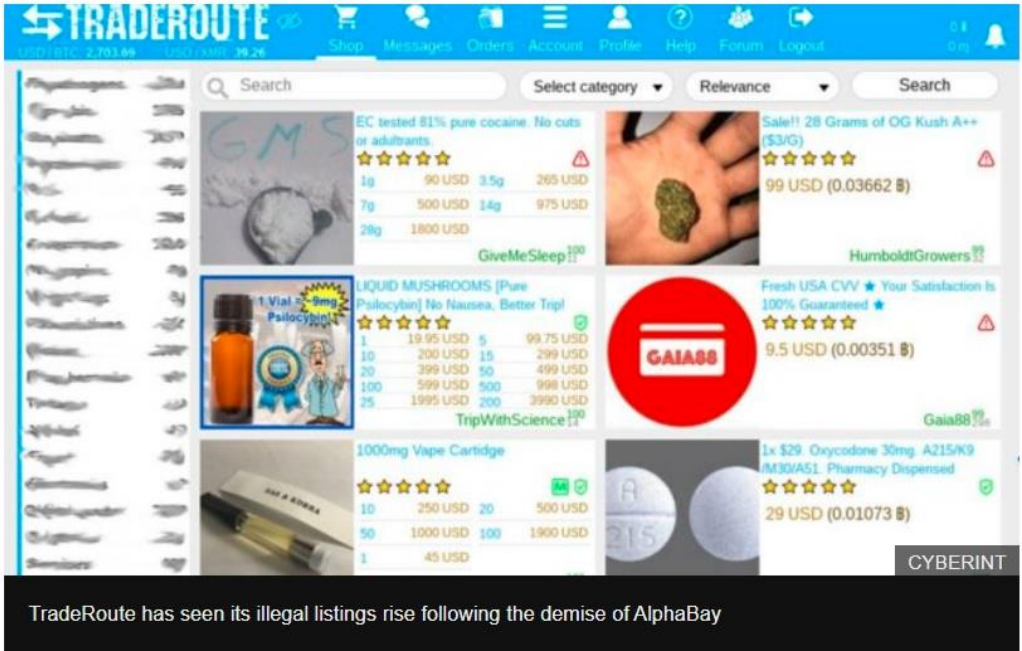
Defining the Cyber Microbiome

- Cyber Microbiome is a symbiont comprised of at least four parasitic cyber flora/fauna
  - Dark Web
  - Cyber viruses, microorganisms, parasites
  - Living Archives
  - Code that writes code
  - Possible 5th area; cyber “junk” DNA



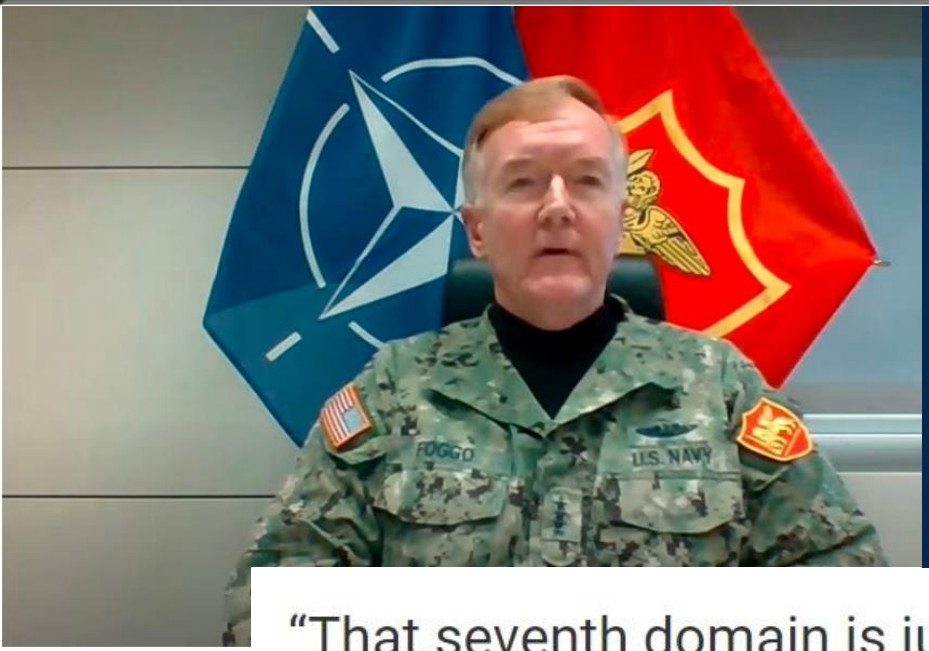
Dark Web

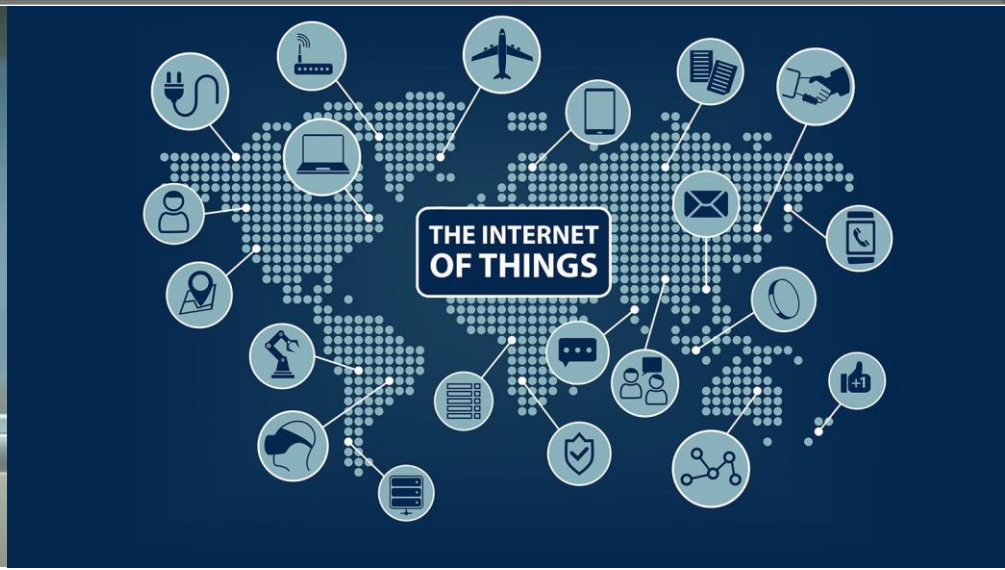




TradeRoute has seen its illegal listings rise following the demise of AlphaBay

Malicious/Lost Code





"That seventh domain is just simply germs. It's the biosphere we operate in."

Adm. James Foggo III

Living Archives

Not secure | constantvzw.org/site/Online-Archive-Erkki-Kurenniemi-In.html

C o n s t a n t

en nl fr

Files

Kurenniemi.ogv

Project: Active Archives

Online Archief: Erkki Kurenniemi (In 2048)

http://kurenniemi.activearchives.org/logbook/

Tijdens Documenta 13 tonen Constantleden Nicolas Malevé en Michael Murtaugh een reeks experimenten rond de visualisatie van het archief van Erkki Kurenniemi, de Finse kunstenaar en technologie-pionier van de jaren '60. Doorheen de jaren documenteerde Kurenniemi zijn alledaagse activiteiten op een obsessieve manier. Hij verzamelde grote hoeveelheden auidvisueel en tekstueel materiaal met de bedoeling een digitale 'back-up' van zijn leven te maken als een template voor het Leven van De Mens.

Dit project is in opdracht van KURATOR en dOCUMENTA (13) in samenwerking met het Central Art Archive of the Finnish National Gallery (Perttu Rastas), en het Contemporary Art Museum KIASMA, Helsinki. Met de steun van Arts Council England.

http://d13.documenta.de/de/#/research/research/view/a-blog-documenting-research-by-constant

Online Archive: Erkki Kurenniemi (In 2048)

http://kurenniemi.activearchives.org/logbook/

For Documenta 13 Constantmembers Nicolas Malevé and Michael Murtaugh are developing a series of experiments in connection with the archive of Erkki Kurenniemi, the Finnish artist and technology pioneer of the 1960s. Over the years, Kurenniemi has obsessively documented his everyday

Online

Living Archives

Living Archives

Joseph Ladon Campbell

Joshua | Home | Create

Joseph Ladon Campbell | Timeline | Recent

Studied at Alabama Christian College

Went to Luverne High School

Photos

Friends · 88 (22 Mutual)

Kevin Campbell is with Joseph Ladon Campbell and Hudson Campbell.

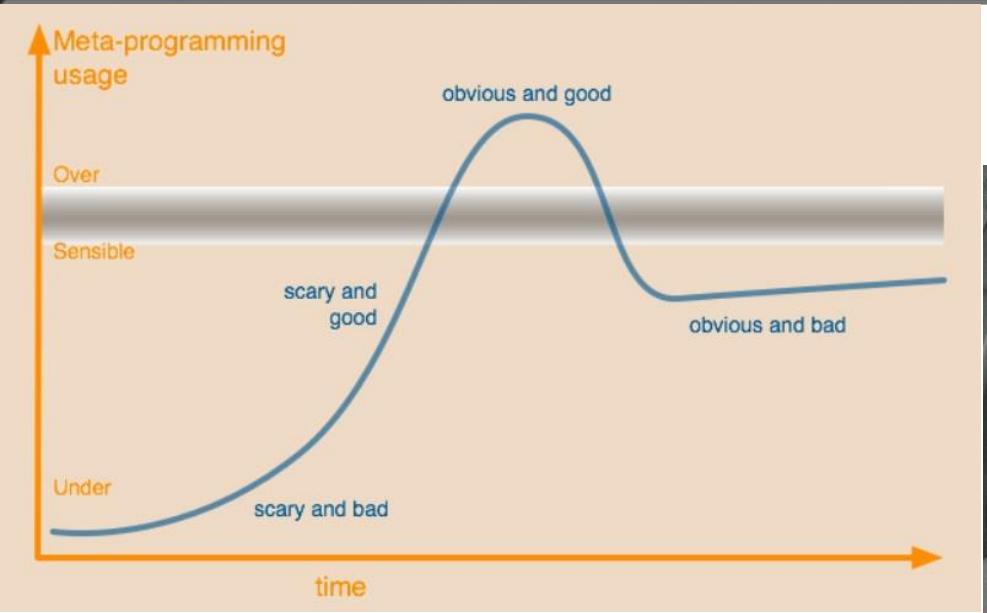
March 27 ·

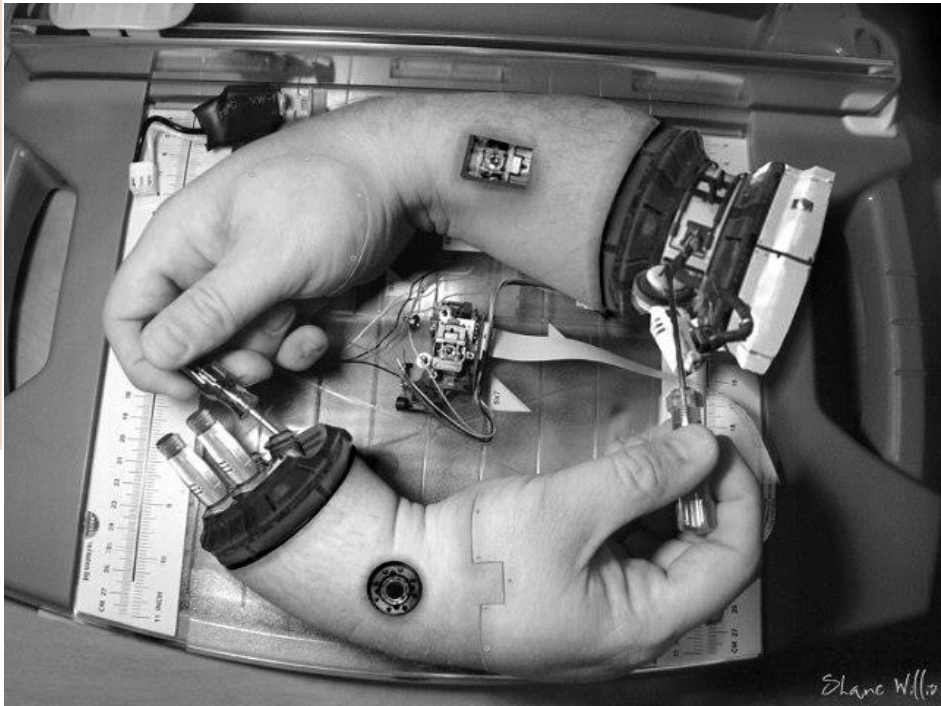
Since today, March 27th is "Joe Day" I thought I'd share one of my very favorite pictures, which features my grandad, dad, me and my son. All of us share the first name of Joseph. 4 generations of "Joes"!

Leslie Helms, Chris Campbell and 45 others

14 Comments

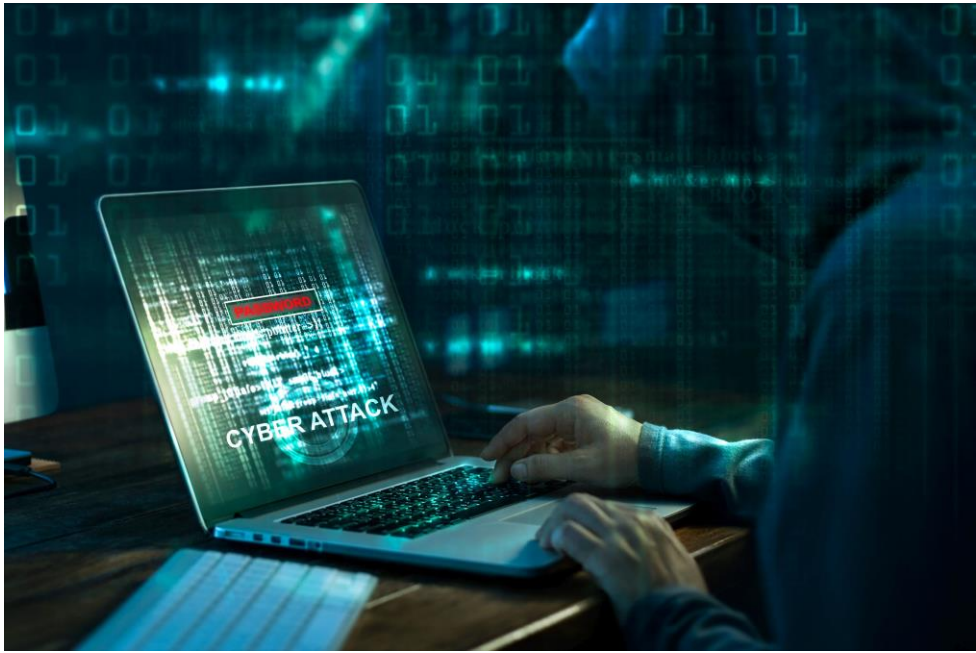
Code that Writes Code





Application of the Cyber Meta-Reality and Cyber Microbiome

- There are numerous ways to use the cyber meta-reality and microbiome as practitioners
  - Threat intelligence
  - Diagnostic
  - Predictive



Application of the Cyber Meta-Reality and Cyber Microbiome – Threat Intelligence

- Primary areas of understanding offered through the *cyber meta-reality* and *cyber microbiome* concept are how threats are **created, proliferated, mutated, and sustained** within these habitats
- Clarity can be derived concerning cyber threats for the purpose of intelligence collection, analysis, and dissemination
- Threat analysts can begin to characterize, categorize, plan, and forecast threat instantiations, growth, change, and foothold in order to better counter, mitigate, and neutralize nascent and existing cyber threats

Figure 1. The JP 2.0 Intelligence Process

Application of the Cyber Meta-Reality and Cyber Microbiome – Diagnostic

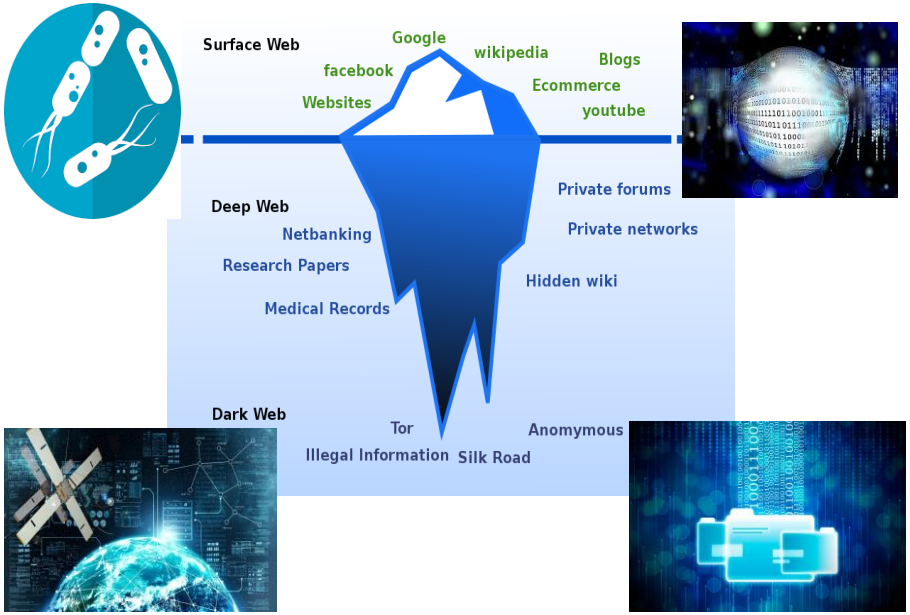
- Just as physicians use the human microbiome as a diagnostic source, the cyber microbiome can be used to diagnose issues stemming from various sources
  - Dark Web – Where is the problem spreading from? What is the source? Who is responsible?
  - Cyber viruses, microorganisms, parasites – What kind of disease is it? How can it be cured?
  - Living Archives – Is there information extant in the meta-reality that could be useful or causing a problem?
  - Code that writes code – Is the problem spreading? How can it be stopped?
  - Cyber DNA and "junk" DNA – Is the problem inherent at the "cyber genetic" level? Is it an issue in the connected information within the system?

Application of the Cyber Meta-Reality and Cyber Microbiome – Predictive

- Many of the issues face in the cyber meta-reality are due to poor signal production and attribution. Predictive solutions could be derived from the cyber microbiome.
  - Dark Web – Build databases of sites, actors, groups, etc. for signature establishment
  - Cyber viruses, microorganisms, parasites – Identify APTs, common toolkits, and cyber diseases
  - Living Archives – Capture archive information to build profile data and leverage historical information
  - Code that writes code - Use code sources and strategies to track where the code began and how to mitigate issues
  - Cyber DNA and "junk" DNA – Identify issues at the lowest, "genetic" level for root information and potential solutions/therapies

Not All Bad

- As practitioners, we must remember that not all information within the microbiome is bad/harmful. Just as our human microbiome is useful and vital to our bodily function, so is the cyber microbiome to the cyber meta-reality.
  - Dark Web – Provides a realm in which to test, explore, and conduct secure operations (TOR was originally a US Navy project)
  - Cyber viruses, microorganisms, parasites – some parasitic data is absolutely necessary to cyber meta-reality functionality and growth (patches, open source, etc.)
  - Living Archives – Archived info can be useful in many ways diagnostically and for predictive analytics. Also valuable to loved ones and perpetuating a type of File Life
  - Code that writes code – Growing in purpose and scope. This is already a possible life form worthy of study due to its ability to grow, consume, and reproduce without destroying itself
  - Cyber DNA and "junk" DNA – Very useful for understanding the basic, fundamental "matter" of the cyber meta-reality and microbiome…

Conclusion

- Understanding the Cyber Meta-Reality and Microbiome can help practitioners pinpoint areas of weakness and understand the cyber multiverse better
- Ultimately, we must continue to explore the ramifications of this new world with its life, multiple realities, and growing influence