

Peace Innovation Knowledge Base

Research outline

The Content

DEFINE PEACE
MEASURE PEACE
IMPROVE PEACE
APPLY PEACE

A. Introduction/Grounding: DEFINE PEACE

1. Positive and Negative Peace
 - Johan Galtung (Norway), Founder of the Peace Research Institute Oslo in 1959 and the Journal of Peace Research in 1964 <https://www.galtung-institut.de/en/home/johan-galtung/>
2. Complimentary approaches
 - Peacekeeping strategies and metrics
Karen Guttieri, Stanford CISAC Affiliate
http://cisac.fsi.stanford.edu/people/Karen_Guttieri
 - Conflict prevention
 - i. Deborah Gordon (Stanford), Executive Director, Preventive Defense Project
http://cisac.fsi.stanford.edu/people/deborah_c_gordon
 - ii. United States Institute for Peace focuses on conflict zones.
Sheldon Himelfarb, Director of the Center of Innovation for Media, Conflict and Peacebuilding at the United States Institute of Peace
<https://www.usip.org/people/sheldon-himelfarb>
<http://www.peacetechlab.org/> and <https://www.usip.org/programs/peacetechlab>
USIP's mission is to inspire a new industry of peacetech entrepreneurs by bringing together engineers and activists
3. Opportunity perception vs threat perception
 - Timo Nyberg, Aalto University, Finland <https://people.aalto.fi/new/timo.nyberg>
4. Combinatoric Innovation

Paul Iske, University Maastricht, Netherlands

<https://www.youtube.com/watch?v=YQJ62H3uP1A>

<http://www.mc4e.nl/maastricht-centre-for-entrepreneurship/our-team/>

5. Competition and cooperation

- We value competition (a society where everybody does the same thing and has the same life would be pretty boring). But competition is the beginning of conflict. How do we achieve cooperation in societies that promote competition? If evolution is a struggle for survival, why are we still capable of altruism?
- Manuela Travaglianti: institutions should control competition

6. Historical background

- Stephen Pinker
- Giorgia Scaturro's "Tech for peace: Facts and figures" (2016) how phones, drones, satellites and computer games help spot and prevent conflict
- Brian Martin: "Technology For Peace And Nonviolent Struggle" (2008)
- Parag Khanna: "Pax Technologica: How Technology Promotes World Peace" (2012)
 - i. Functional integration leads to trust.
 - ii. Conflict arises from a mismatch among people, resources, boundaries.
 - iii. Political devolution/fragmentation (the number of countries quadrupled since 1945) has increased chances of conflict.
 - iv. Connectivity overcomes the conflict.
 - v. Transnational infrastructure of connectivity: transportation, energy, communication
 - vi. This transnational infrastructure changes the incentives of political groups: a country may spend money to support the currencies of other countries currencies, countries may share the same electrical grid, etc
 - vii. Initiatives like the new Silk Road become marketplaces for transnational governance.
 - viii. Rise of functional geography (Internet, telephony, oil pipelines) on top of physical geography.
 - ix. Indirectly, the process of political devolution/fragmentation causes the disappearance of autarchy
 - x. Connectivity physically embeds interdependent governance of transnational infrastructure
 - xi. A new layer of bureaucracy
- Anja Kaspersen (World Economic Forum and Red Cross): "Is technology blurring the lines between war and peace?" (2016) <https://www.weforum.org/agenda/2016/02/is-technology-blurring-the-lines-between-war-and-peace/>
- Michael Shanks <https://classics.stanford.edu/people/michael-shanks>
- John Perry <https://philosophy.stanford.edu/people/john-perry>
- Francis Fukuyama <http://fsi.stanford.edu/people/fukuyama>
- Ian Morris <https://classics.stanford.edu/people/ian-morris> book: "Foragers, Farmers, and Fossil Fuels: How Human Values Evolve" (2015)
- Stephen Krasner http://fsi.stanford.edu/people/stephen_d_krasner
- Renee Bowen on international trade <https://www.gsb.stanford.edu/faculty-research/faculty/renee-bowen>

- Kalev Leetaru (Georgetown University) Institute for the Study of Diplomacy, co-creator of the Global Database of Events, Language, and Tone kalevleetaru.com
<https://isd.georgetown.edu/leetaru>
- History of Peace. Charles Osgood: "Graduated Reciprocation in Tension-reduction" (GRIT), first introduced in the paper "Reciprocal Initiative" (1962) and in the book "An Alternative To War Or Surrender" (1962)
- Robert Sapolsky (Stanford) book "Behave: The Biology of Humans at Our Best and Worst" <https://biology.stanford.edu/people/robert-sapolsky>
- Allen Weiner <https://law.stanford.edu/directory/allen-s-weiner/> Director, Stanford Program in International and Comparative Law. Co-Director, Stanford Center on International Conflict and Negotiation
 - i. Intractable conflicts are conflicts in which each party thinks that success by the other party would threaten survival. They are existential conflicts.
 - ii. Two main factors cause conflict: competing interests and threats to identity
 - iii. Conflicts may escalate due to irrational distrust (distrust that causes both to lose)
 - iv. The barrier: the "enemy" relationship, not just adversarial relationship (the enemy is demonized)
 - v. What modality of presenting data would be pro-social?
 - vi. Peace and Justice: just causes for going to war; just conduct in war (eg, prisoners of war); just aims of war (unconditional surrender? withdrawal?); just post-war behavior (reparations? reconstruction?)
 - vii. Conflict resolution = achievement of a mutually bearable shared future
 - viii. Strategy for conflict resolution: each party should try and articulate the other party's narrative
 - ix. Technology doesn't help when it simply create an echo chamber. Technology may stir more conflict than reconciliation.
 - x. Lee Ross: Barriers to Conflict Resolution
 - xi. Lee Ross: Relationships between Adversaries
- Peter Singer's The Expanding Circle (1981): it is not genes, but our capacity for reasoning that makes moral progress possible
- Erving Goffman
 - i. dramaturgical approach to human interaction
 - ii. micro-sociology of everyday life
 - iii. "interaction order": the organization of everyday behavior
 - iv. reality as a form of game
- Piero's notes for an introduction: Except for a few remote isolated regions of the planet (perhaps in Papua or the Amazon forest or the Okavango Delta), the word "local" has lost its meaning in the human world: everything that is local is now also global. And viceversa: the whole world thrives in every home.

B. MEASURE PEACE

1. Causes of conflict

- see [conflictcauses.pptx](#) (on my PC)
- Group boundaries (gender, nationality, religion): what kind of boundaries are dividing the group? We are genetically programmed to divide the world into tribes, but we can be united by a common goal, the super-ordinate goal: The Robbers Cave experiment -

Sherif, M. (1954). Experimental study of positive and negative intergroup attitudes between experimentally produced groups: robbers cave study.

- Muzafer Sherif talks about the Superordinate Goal
- Cooperative Learning: Elliot Aronson (1967)
https://en.wikipedia.org/wiki/Elliot_Aronson
<http://www.apa.org/research/action/jigsaw.aspx>
- Contact hypothesis
 - i. Amichai-Hamburger, Y., & McKenna, K. Y. (2006). The contact hypothesis reconsidered: Interacting via the Internet. /*Journal of Computer-Mediated Communication*, /11/(3), 825-843.
<http://onlinelibrary.wiley.com/doi/10.1111/j.1083-6101.2006.00037.x/full>
 - ii. Jeel Christine's PPT: <https://www.slideshare.net/jeelchristine/conflict-social-psychology>
 - iii. Allport, G. W. (1954). *The nature of prejudice*. Cambridge, MA: Addison-Wesley.
 - iv. Brown, R., & Hewstone, M. (2005). An integrative theory of intergroup contact. In M.Zanna (Ed.), *Advances in experimental social psychology* (Vol. 37, pp. 255–343). San Diego, CA: Academic Press.
 - v. Hamburger, Y. (1994). The contact hypothesis reconsidered: Effects of the atypical outgroup member on the outgroup stereotype. *Basic Applied Social Psychology*, 15(3), 339–358.
 - vi. Hewstone, M., & Brown, R. J. (1986). Contact is not enough: An intergroup perspective on the Contact Hypothesis. In M.Hewstone & R. J.Brown (Eds.), *Contact and conflict in intergroup encounters* (pp. 1–44). Oxford: Blackwell.
 - vii. Hogg, M. A. (1993). Group cohesiveness: A critical review and some new directions. *European Review of Social Psychology*, 4, 85–111.
 - viii. McKenna, K. Y. A., & Green, A. S. (2002). Virtual group dynamics. *Group Dynamics: Theory, Research and Practice*, 6(1), 116–127.
 - ix. Pettigrew, T. F. (1998). Intergroup contact theory. *Annual Review of Psychology*, 49, 65–85.
 - x. Spears, R., Lea, M., & Lee, S. (1990). De-individuation and group polarisation in computer-mediated communication. *British Journal of Social Psychology*, 29(2), 121–134.
 - xi. Stephan, W. G., & Stephan, C. W. (1985). Intergroup anxiety.
- 7. Peace data. What constitute a peace datum? What is the nature, origin, structure, form, function, etc of peace data? Can we identify the 10-12 factors that define a peace datum?
- 8. "Wicked" problem design for complex social problems
 - QUOTE: As distinguished from problems in the natural sciences, which are definable and separable and may have solutions that are findable, the problems of governmental planning--and especially those of social or policy planning--are ill-defined; and they rely upon elusive political judgment for resolution. (Not "solution." Social problems are never solved. At best they are only re-solved--over and over again.) Permit us to draw a cartoon that will help clarify the distinction we intend. The problems that scientists and engineers have usually focused upon are mostly "tame" or "benign" ones. As an example, consider a problem of mathematics, such as solving an equation; or the task of an organic chemist in analyzing the structure of some unknown compound; or that of the chessplayer attempting to accomplish checkmate in five moves. For each the mission is clear. It is clear, in turn, whether or not the problems have been solved. Wicked problems, in contrast, have neither of these clarifying traits; and they include

nearly all public policy issues--whether the question concerns the location of a freeway, the adjustment of a tax rate, the modification of school curricula, or the confrontation of crime. The formulation of a wicked problem is the problem! The process of formulating the problem and of conceiving a solution (or re-solution) are identical.

- Horst Rittel and Melvin Webber at UC Berkeley "Dilemmas in a General Theory of Planning" presented to the Panel on Policy Sciences, American Association for the Advancement of Science, Boston, December 1969: <https://hbr.org/2008/05/strategy-as-a-wicked-problem> They defined a class of problems they called "wicked problems." The whole paper is here:
http://www.uctc.net/mwebber/Rittel+Webber+Dilemmas+General_Theory_of_Planning.pdf
- Note: Rittel suggested that solving a wicked problem requires "to make those people who are being affected into participants of the planning process. They are not merely asked but actively involved in the planning process".
- Reading material:
 - i. https://www.wickedproblems.com/1_wicked_problems.php
 - ii. https://ssir.org/articles/entry/wicked_problems_worth_solving
 - iii. <http://www.ac4d.com/our-work-philosophy-and-approach-to-education/understanding-wicked-problems/>
 - iv. <https://hbr.org/2008/05/strategy-as-a-wicked-problem>
- Russell Ackoff called them "messes" in "Systems, Messes, and Interactive Planning" that was included in a book titled "Redesigning the Future" (1974): "Every problem interacts with other problems and is therefore part of a set of interrelated problems, a system of problems.... I choose to call such a system a mess."
- Bob Horn (San Francisco) on "messes". Sensor array: social energy map is Bob Horn's process in reverse. Opportunity mapping is mess mapping in reverse. He defining characteristics of a social mess are:
 - i. No unique "correct" view of the problem;
 - ii. Different views of the problem and contradictory solutions;
 - iii. Most problems are connected to other problems;
 - iv. Data are often uncertain or missing;
 - v. Multiple value conflicts;
 - vi. Ideological and cultural constraints;
 - vii. Political constraints;
 - viii. Economic constraints;
 - ix. Often a-logical or illogical or multi-valued thinking;
 - x. Numerous possible intervention points;
 - xi. Consequences difficult to imagine;
 - xii. Considerable uncertainty, ambiguity;
 - xiii. Great resistance to change; and,
 - xiv. Problem solver(s) out of contact with the problems and potential solutions.
- Phase transitions in society. Piero's email: Bob Horn said one thing that impressed me: that you cannot solve a problem alone, you need to solve many problems at the same time, because one influences the others. This causes a reorganization of the whole system. In physics, that is called a "phase transition". I think this is a powerful metaphor. An approach to a wicked problem or mess (such as peace) should be an approach to a phase transition.

- Bernardo Huberman (HP) is an expert in “phase transitions in large scale distributed systems”
- Corina Tarnita (Princeton) <https://scholar.princeton.edu/ctarnita/home> "Corina Tarnita deciphers bizarre patterns in the soil created by competing life-forms. She’s found that they can reveal whether an ecosystem is thriving or on the verge of collapse." <https://www.quantamagazine.org/a-mathematician-who-decodes-the-patterns-stamped-out-by-life-20171220>
- David Snowden
 - i. Snowden, David J. and Boone, Mary E. (2007): “A Leader’s Framework for Decision Making”
 - ii. Snowden, David J. (2005) Multi-ontology sense making: “A New Simplicity in Decision Making”
 - iii. Complex systems are systems in which cause and effect cohere only in retrospect (probe-sense-respond)
 - iv. Chaos is a state in which no cause and effect relationship can be found (act-sense-respond)
- Reading list from Bob Horn:
 - i. Mitroff, Ian I. and Alpaslan, Can M. (2011): “Coping with the Growing Threat of Mega-Crises and Mega-Messes”
 - ii. Ackoff, Russell L. (1981): “Creating the Corporate Future”
 - iii. Horn, Robert E. and Weber, Robert P. (2007): “New Tools For Resolving Wicked Problems: Mess Mapping and Resolution Mapping Processes” http://www.strategykinetics.com/New_Tools_For_Resolving_Wicked_Problems.pdf
 - iv. Hamalainen, Timo J. (2015): “Governance Solutions for Wicked Problems: Collective Learning and Systemic Coordination”
 - v. Taylor, Peter (2005): “Unruly Complexity_ Ecology, Interpretation, Engagement”
- Richard Buchanan (Case Western Reserve University)
 - i. Buchanan, R. (1992). Wicked Problems in Design Thinking. *Design Issues*, 8(2), 5–21.
 - ii. Buchanan, R. (2001). Design research and the new learning. *Design Issues*, 17, 3–23.
- Steven Dow at UCSD <http://spdow.ucsd.edu/> works with Scott Klemmer, co-founder and co-director of the Design Lab <http://d.ucsd.edu/srk/about/>
 - i. Steve Dow's Stanford talk (2017) <https://www.youtube.com/watch?v=hemy827arDY>
 - ii. Critique of design as an individual endeavour: the community has to participate. Design thinking + Crowdsourcing.
 - iii. We need design practices and technology to support the creativity of crowds. We need to teach design effectively to the general public and motivate the public to participate in solving their problems.
 - iv. Improving crowd innovation with expert facilitation
 - v. More interested in qualitative data than quantitative ones: interviews are the main tool. Tag salient moments in the interview. Generate metadata for analysis. Emphasize different perspectives. Possibly also self-interviews.

- vi. His pilot project is the students interviewing other students: June 9 is the presentation. Then they will roll out a project for the city: an innovation challenge. Call for innovation ideas. Interviews will be collected throughout the summer and presented at a October 26 city event organized by Don Norman. He should have preliminary results at the end of September that he is willing to share.
 - vii. His approach could apply to peace innovation because it focuses on: exposing people to other points of view; visualizing the crux of the conflict; consensus building.
 - Don Norman
 - i. Human-centered design requires a deep understanding of people
 - ii. The transition to a sustainable society will require new ways of designing that are informed by a deep understanding of local ecosystems and culture.
 - iii. DesignX (the future of design): design for complex sociotechnical systems ("nine properties, divided into three categories, that characterize DesignX problems")
 - iv. The problem of design is not understanding/modeling the issues but implementing the solutions. Most design results in great ideas but has no last effect on society/firms.
 - v. Political, economic, cultural, organizational, and structural issues hamper implementation.
 - vi. His critique of dschool and IDEO: design doing vs design thinking
 - vii. His role model for implementation: political scientist Charles Lindblom, founder of the theory of "incrementalism" ("The Science Of 'Muddling Through'", 1959)
 - viii. Eric von Hippel (MIT Sloan School of Management): practical methods that individuals, open user communities, and firms can apply to improve their innovation development processes
 - ix. New lab at UC San Diego, which is basically a people-centered citizen-science project to solve complex intractable social problems
 - Margot Gerritsen (Stanford), head of the Institute for Computational and Mathematical Engineering (ICME) <https://icme.stanford.edu/people/margot-gerritsen> HANA Immersive Visualization Environment (HIVA), a scientific visualization wall made up of 35 monitors that allow up to 16 users to connect at once
 - Geoffrey West, former director of Santa Fe Institute: to understand quantitatively the structure and dynamics of social organizations, such as cities and corporations <https://www.santafe.edu/people/profile/geoffrey-west>
 - Stuart Kaufman: self-organizing complex systems <https://www.systemsbiology.org/bio/stu-kauffman/>
 - Paul Saffo <http://www.saffo.com> : Sensors: Accelerating The Pace Of Scientific Discovery <https://www.edge.org/response-detail/26618>
 - A.I. to measure positive engagement (the emotional arc):
 - i. Univ of Vermont (2016) "The emotional arcs of stories are dominated by six basic shapes" <https://link.springer.com/article/10.1140%2Fepjds%2Fs13688-016-0093-1>
 - ii. MIT's Eric Chu, Deb Roy (2017): "Audio-Visual Sentiment Analysis for Learning Emotional Arcs in Movies" <https://arxiv.org/abs/1712.02896>
9. How do we systematically measure things?

- Ad-hoc mobile mesh networks: Patrick Tague, Carnegie Mellon University and NASA Ames <https://www.cmu.edu/silicon-valley/faculty-staff/tague-patrick.html>
- Geoffrey Cohen (Stanford) understanding of the processes underpinning social problems <https://ed.stanford.edu/faculty/glc>
- Jure Leskovec (Stanford) modeling large social and information networks cs.stanford.edu/~jure

10. Conflict in conversation.

- Göte Nyman, Psychologist at Univ of Helsinki
 - i. He had access to a large dataset of chats (managed by scientist Krista X). This is an interesting case study: the data are qualitative, not quantitative.
 - ii. Piero's thoughts (not verbatim what Gote said): P
 - iii. P: The issue is how to turn qualitative data (noncomputational) into quantitative data (computational)
 - iv. P: We need a methodology to tag the chats so that they can be fed into a computer.
 - v. P: Then we need an algorithm to identify the signal of conflict in a chat or group of chats (disagreement is not conflict: when does it become conflict?)
 - vi. P: Then we need an algorithm to determine if the conflict is increasing or decreasing over time between those two people
 - vii. P: The algorithm may be able to prevent conflict: which pattern of conversation is likely to end in conflict?
 - viii. P: The algorithm should also be able to calculate, based on something like pattern recognition, which action can reduce the chance of conflict
 - ix. P: The problem is that the algorithm has to be customized for each person because each person has different behavior in the face of disagreement.
 - x. P: The goal is a phase transition to a balanced state in which the perception of the self and the perception of the other are in equilibrium.
 - xi. Nyman: The individual has to realize that we are in a permanent state of entanglement (like in quantum mechanics).
 - xii. Nyman: It is important to model networks at different levels because we are connected in multiple ways to others
 - xiii. If we cannot represent the ways in which people connect, we cannot understand their conflicts, prevent them, solve them.
 - xiv. Peace = relationships among people
 - xv. The relationships/connections are also dynamic (change over time), not static.
 - xvi. Application of peace methodology: crisis management (done by "peace negotiators")
 - xvii. Piero: conflict is a reaction, not an action, which then becomes an interaction
 - xviii. Piero thinks that conflict in conversation can be due to several different levels of lack of information: hard data may be missing (eg an argument about how many votes you got in a presidential election), statistics may be missing (eg an argument about older people voting for conservative candidates), reputable sources may be missing (eg quoting a scientist in an argument about climate change), the broader context may be missing (is the USA good or bad for peace).

11. Social psychology of the social self <https://aeon.co/ideas/descartes-was-wrong-a-person-is-a-person-through-other-persons> QUOTE: According to Ubuntu philosophy, which has its origins in ancient Africa, a newborn baby is not a person. People are born without 'ena', or selfhood, and instead must acquire it through interactions and experiences over time. So the 'self'/'other'

distinction that's axiomatic in Western philosophy is much blurrier in Ubuntu thought. As the Kenyan-born philosopher John Mbiti put it in *African Religions and Philosophy* (1975): 'I am because we are, and since we are, therefore I am.'

12. Social probes into design space

- Annie Gentes https://webperso.telecom-paristech.fr/front/frontoffice.php?SP_ID=17
- Dacher Keltner (UC Berkeley) Co-Director of the Greater Good Science Center. Emotion and Social Interaction psychology.berkeley.edu/people/dacher-keltner

C.IMPROVE PEACE

13. Persuasive Technology

- Persuasive technology good for increasing good behavior but inefficient for decreasing bad behavior
- A spiral (a positive feedback loop) of positive human engagement (delivery of something that the other party welcomes) instead of negative engagement (like shooting at each other).
- BJ Fogg (Stanford)
- Vivek Singh at Rutgers (formerly MIT Media Lab)
<https://wp.comminfo.rutgers.edu/vsingh/behavioral-informatics-lab/> "Behavioral Informatics focuses on sensing, understanding, and shaping human behavior in a data-driven manner" His papers include *Social Persuasion in Online and Physical Networks* (2014) and *Sensing, Understanding, and Shaping Human Behavior* (2013)
- John Cacioppo: "The neuroscience of persuasion" (2017)
- Matthew D. Lieberman (UCLA) <http://www.scn.ucla.edu/people/lieberman.html> "The neural correlates of persuasion"
- Ian Bogost www.bogost.com and www.iac.gatech.edu/people/faculty/bogost Author of the book "Persuasive Games"
- Robert Cialdini (North Carolina): 6 principles of persuasion "Influence: The Psychology of Persuasion" (1984) <https://www.influenceatwork.com>
- James Landay (Stanford), Founder of the World Lab, a collaboration with Tsinghua University <https://profiles.stanford.edu/james-landay> Technology to Support Behavior Change
- Byron Reeves (Stanford), author of "The Media Equation: How People Treat Computers, Television, and New Media Like Real People and Places" <https://comm.stanford.edu/faculty-reeves/>
- Jeremy Bailenson <https://comm.stanford.edu/faculty-bailenson/> how to use VR as a persuasion tech
- Do the new mediating technologies increase polarization? Manuela Travagianti is studying the negative effects of mediating technologies.
- Manuela Travagianti disagrees with the "contact hypothesis", or Intergroup Contact Theory. The contact hypothesis says that the best way to improve relations among groups that are experiencing conflict is for them to have contacts. This theory originated with Gordon Allport's "The Nature of Prejudice" (1954). Thomas Pettigrew and Linda Tropp (2000) found that 94% of the time conflict diminishes as intergroup contact increase.

14. Behavior Design

- Empirical way of thinking about humans: what does he do, regardless of what he thinks and believes

- Don Norman “The psychology of everyday things. Aligning market forces in the right direction” (1988)
- Brown, T., Wyatt. J. (Stanford): “Design Thinking for Social Innovation” (2010)
- Kristina Niedderer www.niedderer.org: “Mindful Design as a Driver for Social Behaviour Change” (2013)
- Ellen Langer www.ellenlanger.com : “Mindfulness” Harvard professor of psychology, Ellen Langer: about
- Debra Lilley, Loughborough Design School www.lboro.ac.uk/departments/design-school/staff/debra-lilley/ “Designing for Behavioural Change” (2007) and “Design for sustainable behavior” (2009)
- Nynke Tromp, Paul Hekkert, Peter-Paul Verbeek: “ Design for socially responsible behavior” (2011) understanding how design thinking can be applied to social issues
- Stephen Clune: “Design for Behavioural Change” (2010)
- Ozenc Kursat: “Modes of Transitions: Designing interactive products for Harmony and Well-Being” (2014)
- Computational social science: a new emergent superfield that includes all social sciences - how is technology changing social science
 - i. Hanna Wallach (Microsoft Research) chapter "Computational Social Science: towards a collaborative future" (2015)
 - ii. Claudio Cioffi-Revilla, George Mason Univ, Computational Social Science <http://www.css.gmu.edu/?q=node/16> Introduction to Computational Social Science
 1. Notation is essential to organize knowledge in a proper systematic way, e.g. Unified Modeling Language
 2. Collaborative technology is needed for social-science researchers
 3. Time-series analysis can discover underlying dynamics in interactions
 4. Game theory has contributed significantly to computational peace studies
 - iii. David Lazer <http://www.davidlazer.com/research-areas/computational-social-science> Introduction to Computational Social Science
 - iv. Sharad Goel (Stanford) Introduction to Computational Social Science
 - v. Computers as Social Actors: Byron Reeves & Clifford Nass' "The Media Equation: How People Treat Computers, Television and New Media Like Real People and Places" (1997)
 - vi. Trust: Dominika Latusek & Alexandra Gerbasi's "Trust and Technology in a Ubiquitous Modern Environment" (2010)
 - vii. Paolo Parigi (Stanford) <https://web.stanford.edu/~pparigi/> Specialist in Trust
 1. First time in history we have data on individual-to-individual interactions because computing technology mediates interactions
 2. We can design online "field" experiments
 3. we cannot remove risk from interactions but we can minimize it
 4. Reputation and trust are contextualized: they don't automatically transfer to other domains
 5. Reputation platforms can also overcome biases
 6. Trust is required when there is risk. Blockchain, for example, is not about trust but about coordination.

7. Potential danger of reputation platforms: too much information about strangers creates weaker social ties (no need to be real friends)
 8. Piero: What is the difference between recommendation algorithms (that create "trust" between a consumer and a brand) and trust algorithms? They both facilitate interactions among strangers, measure behavior, and result in a financial transaction. The only difference is that the trust algorithm broadcasts your reputation to everybody.
 9. Lecture on trust
 10. Joe Gebbia's TED talk How we design for trust
 11. Paper with Karen Cook: Online Field Experiment
- viii. Juan Pablo Hourcade (Iowa) <http://homepage.divms.uiowa.edu/~hourcade/>
 "HCI for Peace: Promoting Peace and Preventing War Through Computing Technology", "HCI for Peace: An Invitation to Positive Action", "HCI for Peace: A Call for Constructive Action"
 - ix. Natasha Bullock-Rest (Rush Univ, Chicago), psycholinguist who collaborates with Juan Pablo Hourcade
- Decision science approach to design - political science innovation.
 Gabrielle Wong-Parodi | Carnegie Mellon University
<https://www.cmu.edu/energy/energy-experts/alpha-list/gabrielle-wong-parodi.html>
 Develop and evaluate human-centered interventions to improve community resilience and sustainability
 - Stephen Anderson: "Seductive Interaction Design: Creating Playful, Fun and Effective User Experiences" (2011)
 - Chris Nodder: "Evil by Design: Interaction Design to Lead Us into Temptation" (2013)
 - Anneli Selvefors, Karin Blindh Pedersen, Ulrike Rahe: "Design for sustainable consumption behaviour: systematising the use of behavioural intervention strategies" (2011)
 - Renee Wever, Jasper van Kuijk, Casper Boks (2008). User-centered design for sustainable behavior" (2008)
 - Stephen Wendel: Designing for Behavior Change" (2013)
dl.finebook.ir/book/78/14526.pdf
 - Dan Lockton: "Design with Intent" (2010) www.danlockton.com
 - Behavior design + persuasive tech = interaction design
 Timo Nyberg, Aalto University, Finland <https://people.aalto.fi/new/timo.nyberg>
 REDD, the Rapid Experimentation and Deal Design method, applying peace innovation insights for increasing positive engagement within and between businesses
 - Cybernetic loop: sensors - communication - computation - actuator
 - Augmenting humans' ability to interact
 - Marshall McLuhan and Doug Engelbart: technology as an extension of human body
 - Dawkins: extended phenotype
 - FEEDBACK FROM WORKSHOP: Wishful thinking that if the technologies he talked about are developed, it will be for the good, kind of a "rising tide lifts all boats" view. I'd like to see more analysis or a model of what he thinks are the determinants of the technology being put to good vs bad use. I'm particularly interested and concerned about these technologies will interplay with concentration of power/wealth, which he not address much.

- Piero: Technology for good is easy to be weaponized - asked to develop a more efficient gas chamber for Hitler, Silicon Valley engineers would just deliver one
- FEEDBACK FROM WORKSHOP: Sensors in his intro had a feel of just trying to glom in big data and IoT since they are hot topics. I think most of his data comes from social media level of sources. I guess this is a little unfair on my part, but I think he should hold off on talking about sensors until he has stronger examples.
- FEEDBACK: There should be other incentives to peace
- PIL's tenet about tech that generates economic wealth has a weak point: that tech can have dual use
 - i. Design tech in a way that cannot be weaponized
 - ii. Technology is destabilizing both politics and society
- Michal Kosinski (Stanford) <https://www.gsb.stanford.edu/faculty-research/faculty/michal-kosinski> or www.michalkosinski.com/ "Private Traits and Attributes are Predictable from Digital Records of Human Behavior" (2013) showed that "easily accessible digital records of behavior, Facebook Likes, can be used to automatically and accurately predict a range of highly sensitive personal attributes including: sexual orientation, ethnicity, religious and political views, personality traits, intelligence, happiness, use of addictive substances, parental separation, age, and gender." An interesting talk about the negative effects of mediating technologies.
- Esther Duflo (MIT): a new way to fight poverty "Poor Economics: A Radical Rethinking of the Way to Fight Global Poverty" <https://economics.mit.edu/faculty/eduflo>
- Jennifer Aaker (Stanford) difference between happiness and meaning <https://people.stanford.edu/jaaker/>
- Hirokazu Shirado and Nicholas Christakis, researchers at Yale University's Institute for Network Science <http://yins.yale.edu/our-people>, look at artificial intelligence (AI) not in the usual way—as a potential replacement for people—but instead as a useful companion and helper, particularly for altering human social behavior in groups. Summary: <http://www.sciencemag.org/news/2017/05/bad-bots-do-good-random-artificial-intelligence-helps-people-coordinate> Paper of 2017: <https://www.nature.com/nature/journal/v545/n7654/full/nature22332.html>

15. Trust Algorithms

- Airbnb
- Brian Behlendorf open-source blockchain technology <http://brian.behlendorf.com/>
- Ashish Goel (Stanford) <http://web.stanford.edu/~ashishg/> Director of RAIN (Research on Algorithms and Incentives in Networks) <http://rain.stanford.edu/>
- Amin Saberi (Stanford) <https://stanford.edu/~saberi/>
- Algorithmic Game Theory www.cs.cmu.edu/~sandholm/cs15-892F13/algorithmic-game-theory.pdf
- Karen Cook (Stanford), world expert on trust <https://sociology.stanford.edu/people/karen-cook>
- Margaret Neale (Stanford) on negotiating: <https://www.gsb.stanford.edu/insights/margaret-neale-negotiate-get-more-what-you-want>

16. Open Innovation

- Henry Chesbrough (UC Berkeley), inventor of open innovation: a company or organization should make greater use of external ideas in its business and allow its own

ideas to go out beyond its own boundaries to others

<https://corporateinnovation.berkeley.edu/open-innovation-research/>

- James Fishkin (Stanford) and Bobby Fishkin: "The Deliberative Corporation is a technology-supported process for sustainable decision-making. It allows any organization or governing group to consult its population. The process builds trust and knowledge so that the implementers can find out what the people would think if they were thinking. It builds political capital and informed consent so leaders can make the right decision even when this involves significant complexity and difficult tradeoffs." Winner of the McKinsey/Harvard Business Review Management 2.0 competition:
- <http://www.managementexchange.com/hack/deliberative-corporation>

17. Cooperative design thinking ("service design")

- What kind of technology is best for producing peace in a specific environment
- Design thinking is competitive and therefore not scalable
- History of design thinking <https://medium.com/@szczpanks/design-thinking-where-it-came-from-and-the-type-of-people-who-made-it-all-happen-dc3a05411e53>
- Satu Miettinen (Lapland University in Finland), Professor of Service Design <http://sinco.fi/> <http://www.satumiittinen.com/>
- Rieko Yajima said that European design thinking is more advanced than US: why?
- Buckminster Fuller's design science: to solve problems by introducing into the environment new artifacts, the availability of which will induce their spontaneous employment by humans and thus, coincidentally, cause humans to abandon their previous problem-producing behaviors and devices <https://www.bfi.org/about-fuller/big-ideas/design-science>
- Bucky Fuller: comprehensive anticipatory design science: "to make the world work for 100% of humanity, in the shortest possible time, through spontaneous cooperation"
- Bucky Fuller's world peace game <http://nautil.us/issue/28/2050/lets-play-war>
- David McConville, Director of the Buckminster Fuller Institute <https://www.bfi.org/about-fuller/big-ideas/synergetics>
- Buckminster Fuller's "Spaceship Earth" - A world map is needed which enables us to highlight the relationships among all nations and cultures of the world rather than one which emphasizes artificial boundaries between them - <https://www.bfi.org/about-fuller/big-ideas/spaceshipearth>
- Evolutionary algorithms on interaction design
- Interaction design: Neeraj Sonalkar a language for innovation that they call Interactions Dynamics Notation <https://hpi.de/en/dtrp/people/members/neeraj-sonalkar.html>
 - i. A language for innovation that they call Interactions Dynamics Notation
 - ii. paper
 - iii. How to model interaction between people
 - iv. Division of labor for innovation ('venture development')
 - v. Exploring the relationship among technology, society and business
 - vi. New methods of developing ecosystems of innovation
 - vii. Innovation ecosystem = team collaboration
 - viii. A factory that produces 100s of startups
 - ix. Discover the needs of a city and model them
 - x. The city is a living organism: needs change, tech changes
 - xi. Cooperative design thinking

- xii. John Arnold at Stanford (1959) taught creativity to engineers and formed a design group <https://blog.rwth-aachen.de/designthinking/2016/01/30/design-thinking-history-the-impact-of-stanford-prof-john-arnold/>
- xiii. The behavioral side of innovation: how do teams get together to create innovation
- xiv. Recipe model vs No-recipe model (when the recipe is not relevant anymore)
- xv. "Invent" is the no-recipe model, inventing is about generating new ideas, and this is what great design teams do
- xvi. IDN is the notation to describe this project
- xvii. Influenced by cognitive semiotics, Ade Mabogunje's Real-time Venture Design Lab program (ReVeL), and by Leonard Talmy's "Force Dynamics in Language and Cognition" (1988)
- xviii. Summary of Force Dynamics: <http://cogweb.ucla.edu/CogSci/Talmy.html>
- xix. Force Dynamics was a visual language for narratives
- xx. Eg, sustainable entrepreneurship: generate new ideas and experience, learn from failures
- xxi. detour: consequence-driven logic vs identity-based logic (great visionary leaders are driven by values) - see James March choo.fis.utoronto.ca/fis/courses/lis2176/Readings/march.pdf
- xxii. But also very influenced by improvisational theater and jazz improvisation
- xxiii. In 2011 Sonalkar adapted it to interaction: response-based (what is the response of the other members of the team to an idea) and capture visually the dynamics of interaction
- xxiv. Lucy Suchman http://www.wikiwand.com/en/Lucy_Suchman studied user behavior at Xerox PARC (she wrote The problem of human-machine communication in 1985 www.lancaster.ac.uk/fass/doc_library/sociology/suchman_cv.pdf republished in 2007 with additional chapters) and then came to Stanford to study design behavior
- xxvi. IDN+Machine Learning = best practices of interaction (or at least interaction patterns)
- xxvii. He is willing to write a chapter of the book
- Calculus of social interactions? Process calculus: Robin Milner's Calculus of Communicating Systems (1973), Tony Hoare 's Communicating Sequential Processes (1977), Jan Bergstra and Jan Willem Klop's Algebra of Communicating Processes (1982), Luca Cardelli and Andrew Gordon's ambient calculus (1998)
- Taranjeet Singh Bhatia's quantitative studies of social interactions applied to robotics (2016)
- Ade Mabogunje, Stanford Design Observatory, using the design laboratory as a research instrument, equivalent of the microscope for social science <http://www-cdr.stanford.edu/observatory>
 - i. Humans are designers, they design things
 - ii. Design is about measuring feedback
 - iii. There are seven basic measurements in the hard sciences: what are the basic measurements of innovation?
 - iv. The design coach, who guides the designers (e.g., the venture capitalist)
 - v. Entrepreneurs are storytellers
 - vi. Piero's comment: PIL designs a good that is positive engagement

- vii. PIL designs systematic innovation
- Howard Rheingold: cooperation commons papers at <http://cooperationcommons.com>
- Martin Nowak (Harvard Program for Evolutionary Dynamics): "Evolutionary dynamics on any population structure" (2017)
<https://news.harvard.edu/gazette/story/2017/03/harvard-scientists-help-develop-algorithm-that-predicts-social-cooperation/>
- Benjamin Allen: "Global cooperation depends on the strength of local connections" (2017)
 - i. Quote: "Cooperation flourishes best when each individual has strong, reciprocated connections to a small number of others. In this case, cooperation spreads locally, along these connections, leading to clusters of cooperators who share benefits with each other. In contrast, if all individuals are equally connected to all others, the benefits of cooperation become diluted in the sea of non-cooperators, and the behaviour cannot spread."
 - ii. The original study was actually done at Harvard by Martin Nowak's team (Program for Evolutionary Dynamics) and Harvard mathematicians. Here is their summary <https://news.harvard.edu/gazette/story/2017/03/harvard-scientists-help-develop-algorithm-that-predicts-social-cooperation/> and the original paper, "Evolutionary dynamics on any population structure", is in Nature 13 April 2017
<http://www.nature.com/nature/journal/v544/n7649/full/nature21723.html>
- This is the exact opposite of what is happening in today's world: local connections are getting weaker
- Sapolsky's comment: what do you want ideally in a network? Lots of connections between closely spaced nodes -- local connections like that make for a stable functional module that can coordinate its members, withstands damage to it. But there's a problem, which is that with nothing but local connections, the network is this isolated module, unable to come up with a novel, adaptive response during a novel challenge. So, have some long distance projections as well. But how to get the optimal balance between your number of local projections, number of middle-distance ones, number of long distance? All sorts of theoretical models (which I can't remotely begin to understand), says that the optimal solution is described by something called a "power law function" -- it's basically a curve where roughly 80% of projections are local, 15% moderate distance, 4.9% long distance, 0.09% long long distance, etc. So, in theory, that winds up being the way of balancing local strengthening connections and long distance creative ones. And then, it turns out that all sorts of things in the real world have projections that follow a power law distribution. As one example, parts of the cortex develop showing that pattern. Then, at the other end of the universe, a number of predator species hunt with a power-curve distribution. For example, some predatory fish (I'm forgetting what) swims a certain distance in one direction hoping to find something to eat, then changes direction for another foray, then changes direction... And about 80% of forays are short distance, 15% moderate distance, 4.9%... And fish who follow that pattern optimize finding stuff to eat. So just a cool emergent pattern in lots of different systems...
- Erez Yoeli (Yale) promoting cooperation act.yale.edu/people/erez-yoeli
- Measurement: Charles Osgood's EPA-space of meaning (Evaluation, Potency, and Activity) from "The Measurement of Meaning" (1957). Every concept has both a

denotative meaning and an affective meaning. The latter is defined by three coordinates: evaluation (eg, goodness versus badness), potency (powerfulness versus powerlessness) and activity (liveliness versus torpidity). Affective meanings can be measured with semantic differentials. A sentiment is a stable (or "fundamental") affective meaning. Sentiment dictionaries have been constructed by scholars. An event generates emotion for an individual involved in it. The emotion is a function of the difference between impression and sentiment. David Heise and Christine Averett ("Modified Social Identities", 1987) used nonlinear equations to represent emotions and to predict emotions that arise in social interaction.

- Martin Nowak (Harvard): evolution of cooperation - Program for Evolutionary Dynamics ped.fas.harvard.edu
- Moshe Hoffman (Harvard's Program for Evolutionary Dynamics) <https://sites.google.com/site/hoffmanmoshe/>
- Treasure-hunt model of innovation – Important to identify and store knowledge of what doesn't work, which is usually wasted.
- Larry Leifer (Stanford dschool) <https://dschool.stanford.edu/directory/>
- Ray Levitt (Stanford) <http://web.stanford.edu/~rel/>
Methodology and computer simulation tools to design organizations that can optimally execute complex, fast-track, projects and programs, and service/maintenance work processes
- Saumitra Jha (Stanford) <https://www.gsb.stanford.edu/faculty-research/faculty/saumitra-jha>
Social organizations and innovations to address the problems of violence and other political risks, and to seek new lessons for fostering peace and development
- Wendy Ju (Stanford), Executive Director, Interaction Design Research <http://www.wendyju.com/>
- David Beach (Stanford), Director of the Product Realization Lab <https://productrealization.stanford.edu/team/leadership-team/david-beach>
- Micah Lande (Arizona State Univ) Design Thinking & Creative Problem Solving <http://micah.landeland.com>
- Bill Burnett (Stanford), Executive Director of the Design Program at Stanford, has written "Designing Your Life" (quote: "how design thinking can help create a more meaningful and fulfilling life") <http://designingyour.life/about/>

18. Nonviolent practice

- Nonviolent communication
Marshall Rosenberg www.ayahuasca-wasi.com/english/articles/NVC.pdf
- Contemplative computing
Alex Soojung-Kim Pang, Oxford and Visiting scholar at Stanford
History and Philosophy of Science and Technology
The Distraction Addiction (2013)
<https://www.youtube.com/watch?v=d7HZ0Jke1Mc>

19. Participatory action

- FEEDBACK FROM WORKSHOP: remove power from the elite. How about DAOs (Decentralized Autonomous Organizations)?
- Network Forms of Organization
Walter "Woody" Powell (Stanford) <https://ed.stanford.edu/faculty/woodyp>
Book "The Emergence of Organizations and Markets" (2012)

Article "Neither Market Nor Hierarchy: Network Forms of Organization" (1991)
www.uvm.edu/pdodds/files/papers/others/1990/powell1990a.pdf

- Harnessing the wisdom of crowds/ Argument Mapping:
 - i. Tim van Gelder (University of Melbourne, Australia)
SWARM (Smartly-assembled Wiki-style Argument Marshalling)
the arguwiki: a platform that can also help improve reasoning in the public arena
<https://pursuit.unimelb.edu.au/articles/making-big-sense-of-big-data-the-quest-to-improve-human-reasoning>
 - ii. Others in Argument Mapping?
- Michael Bernstein (Stanford) <http://hci.stanford.edu/msb/> Crowdsourcing and social computing systems that enable people to connect toward more complex goals
- Ashish Goel (Stanford) <http://web.stanford.edu/~ashishg/> on Crowdsourced Democracy
- Monica Lam (Stanford) <https://suif.stanford.edu/~lam/> building an open and federated social computing infrastructure
- Dan Jurafsky (Stanford) computational linguistics and its application to the behavioral and social sciences web.stanford.edu/~jurafsky/
- Dustin Haisler, Chief Innovation Officer for e.Republic www.dustinhaisler.com
- Radhika Nagpal <http://www.radhikanagpal.org/> of the Self-Organizing Systems Research Group at Harvard Univ <http://www.eecs.harvard.edu/ssr/> : self-organizing multi-agent systems in which large numbers of simple agents cooperate to produce complex and robust global behavior
- Gabriele Valentini: Self-organized collective decision making: the weighted voter model (2014)
- Adria LeBoeuf & Christina Grozinger: "Me and we: the interplay between individual and group behavioral variation in social collectives "(2014) - University of Lausanne
- Learn from social animals
 - i. Ehud Fonio: collective navigation by ants
<https://elifesciences.org/articles/20185>
 - ii. Amos Korman: "Confidence Sharing: An Economic Strategy for Efficient Information Flows in Animal Groups" (2014)
<http://journals.plos.org/ploscompbiol/article?id=10.1371/journal.pcbi.1003862>

20. Consensus Building

- Bibliography on Consensus Building
<http://journals.sagepub.com/doi/abs/10.1177/1473095204042315>
- Introduction to Consensus Building
<http://www.beyondintractability.org/essay/consensus-building>
- Judith Innes (UC Berkeley College of Environmental Design) "how to improve the use of information in public policy" and "how to develop new concepts of governance to deal with collaboration" <https://ced.berkeley.edu/ced/faculty-staff/judith-innes> Planning Through Consensus Building (1996) WASTE OF TIME
<http://www.tandfonline.com/doi/abs/10.1080/01944369608975712>
- Consensus Building and Complex Adaptive Systems by Judith E. Innes & David E. Booher (2007) <http://www.tandfonline.com/doi/abs/10.1080/01944369908976071>
- Judith Innes (UC Berkeley) <https://ced.berkeley.edu/ced/faculty-staff/judith-innes>
- Robert Briggs (San Diego State University) and Gwendolyn Kolfschoten (Delft University of Technology): "Toward a Theoretical Model of Consensus Building" (2005)

https://www.researchgate.net/publication/220889509_Toward_a_Theoretical_Model_of_Consensus_Building

21. Participatory Democracy for Wicked Problems

- Robert Putnam, in his book "Bowling Alone - The Collapse and Revival of American Community" (2000), argued that the USA suffers from civic malaise which results in a decline of participatory democracy: citizens are increasingly disengaged from the process of providing input to the policy-makers who make decisions about the urban landscape in which those citizens live. At the same time, since at least 1999, Susan Fainstein has been evangelizing for a "just city" (also the title of her 2011 book), urban planning that would result in social justice.
- Judith Innes and David Booher, authors of "Planning With Complexity" (2010), pioneered the field of collaborative policy making. Judith Innes is credited with coining the term "communicative planning" in her article "Planning Theory's Emerging Paradigm - Communicative Action and Interactive Practice" (1995). The scenarios that they explore are "wicked problems" in which multiple diverse stakeholders are locked in conflict. These scenarios occur frequently in cities all over the world when it comes to difficult policy decisions in urban and environmental matters. Their "collaborative rationality" is a method of conflict resolution that consists in having the various stakeholders interact in person and deliberate together. This results in expanding their opinion space to incorporate the perspective of the other parties. Finding consensus in this multi-dimensional space consist in finding a point that represents an acceptable scenario for each stakeholder, albeit not the perfect one. This is mathematically similar to the homeostatic stability of a self-regulating system, to the equilibrium state that a complex adaptive system may reach due to the stress caused by opposing constraints. The "wicked problem" can be viewed as a non-linear systems comprised of multiple, interdependent stakeholders. "Collaborative rationality" creates bonds of mutual trust and shared understanding among the stakeholders. They see this method of collaborative policy making as particularly effective in scenarios where the decision process is fragmented among several agencies and/or technical experts are not trusted.
- An urban area is traversed by what Patsy Healey called "relational webs" (or "social networks") in her article "Collaborative Planning" (1997) and in her book "Urban Complexity and Spatial Strategies" (2007), drawing on Jurgen Habermas's theory of communicative action. A person's life is largely lived in relational webs, like family and workplace, which generate systems of meaning, languages and metaphors. Healey argued for a process of "inclusionary argumentation" that fosters dialogue between groups and creates a common discourse, so that "planning becomes a process of interactive collective reasoning".
- Amanda Goldstein reported, in her thesis "Community Engagement in Sustainable Design" (2011), about how citizen participation benefited social justice in the community of Oberlin, a small town in Ohio that in 2007 launched a project to create a sustainable city.
- "Collaborative rationality" is related to John Dewey's "community of inquiry" as discussed in his book "The Public and its Problems" (1927). This book was a response to Walter Lippmann's book "The Phantom Public" (1925) which argued that the public of democratic citizens was an illusion. Dewey recognized that powerful forces (ranging from special-interest groups to multinational corporations and even including entertainment) are constantly at work to suppress public deliberation (or, better, to create multiple publics). Dewey instead advocated an active role for the public through

improved communication so that it could become not only a rational participant in democracy but also a strong and cohesive one. "Communication can alone create a great community". Dewey, borrowing the concept from Peirce, viewed a "community of inquiry" as a group involved in a process of empirical or conceptual inquiry into a complex problem.

- Patricia Shields applied the Community of Inquiry paradigm to public policy ("The Community of inquiry", 2003).

22. Empathy

- Steve Omohundro: Empathy and technology
 - i. Non-violent communication, founded by Marshall Rosenberg
 - ii. Replika is a chatbot that learns your chat style so it can mimic your online behavior (a "memorial" chatbot because it can even replicate a dead person). This can be used to clone your own style of communication, and show you how you appear to others.
 - iii. There is a whole branch of AI, sentiment analysis, that studies the "mood" of a sentence.
 - iv. An AI could potentially "correct" the emails/chats that you are typing and translate your rude style into a more empathetic style.
 - v. The very first AI chatbot, ELIZA, was an empathizer.
 - vi. At the same time empathy can be weaponized (Cambridge Analytics learned to empathize with social-media users and exploited them)
 - vii. Empathy can arise from the direct experience of somebody else's reality.
 - viii. Technology should start by empathizing with users: empathy of communicating with the computer, with the user's needs. If the user interface cannot empathize with its user, how can we trust that the software will create empathy among users.
 - ix. The mediating technology has to behave like a monk: interpret the views of the two parties in a conflict at a higher level of abstraction.
 - x. Piero's counter-argument: conflict is more monetizable than no-conflict, therefore there is a vested economic interest in creating and amplifying conflict. Conflict is addiction like tobacco and pollutant like industrial pollution. There is an economic value in the addiction and pollution of conflict.
 - xi. Technology creates echo chambers that increase conflict. We need technology that will reward the opposite of the echo chamber: listening to other's views.
 - xii. We need technology that can promote empathy as a socially desirable role like "no smoking" and "recycle".
 - xiii. Piero's counter-argument. Social-media platforms need to monetize the social interactions, and therefore their algorithms will propagate both real and fake news if they generate revenues. The algorithm cannot distinguish between real and fake, but it can easily count revenues. What is true on a social-media platform is what makes money for that platform.
 - xiv. Trust is vulnerable. Trust generates revenues: consumers read reviews and are influenced by them. Therefore businesses are interested in twisting those reviews to their advantage. Firms that control those reviews are under pressure to accept "bribes" to alter the visibility of positive reviews. Review platforms can become extortion platforms: "pay a fee and we'll push positive reviews to the

top, cancel and we'll push the negative reviews to the top". There is economic pressure to break any trust system.

- Against it: Paul Bloom (Yale)'s "Against Empathy" Emotional empathy may result in bad decision making <http://psychology.yale.edu/people/paul-bloom>

23. Resident Artists Program (RAP)

- For example: Eyebeam.org
- Physical space?
 - i. Montalvo
 - ii. SVAIRI
 - iii. Institute for the Future
 - iv. Stanford? Talk to Gail Wight, Terri Berlier, Camille Utterbach, Matthew Tiews...
- Open call:
 - i. What do you need from the Peace Innovation Lab?
 - ii. What would be the model of collaboration?
- Lots of artists already interested
- See air.doc

24. What would help peace (various feedback from workshop)

- A longer attention span
- Technologies that build bridges between groups such as
 - i. machine translation,
 - ii. elearning,
 - iii. Harvard economist Thomas Schelling's "The Strategy of Conflict" (1960) viewed game theory as a unifying framework for the social sciences.
 - iv. Buckminster Fuller: "World Peace Game" (1961), an alternative to the war games uses of the Cold War, a method to broker world peace: a group of players to cooperatively solve a set of problems to "make the world work for 100% of humanity in the shortest possible time through spontaneous cooperation without ecological damage or disadvantage to anyone". Comprehensive Anticipatory Design Science.
 - v. John Harsanyi: games of incomplete information ("Games with incomplete information played by Bayesian players", 1967).
 - vi. John Maynard Smith applied game theory to biological evolution ("Game Theory and The Evolution of Fighting", 1972)
 - vii. videogames - Game design research group: Chris Bennett (Stanford)
 1. Game design thinking is the intersection of game-design science, behavior design, and neuroscience
 2. MDAO framework: mechanics -> dynamics -> aesthetics -> outcome but played in reverse: first define the outcomes, then derive the aesthetics (what would engage the player, stimulate her emotions), then select the appropriate mechanics
 3. The purpose of prototyping is to make it fail and then study why it failed
 4. Gamification failed
 - viii. Neuroscience of engagement: paper by David Rock & Yiyuang Tang (2009)
 - ix. Jane McGonigal <https://janemcgonigal.com> Her games target a collective audience. Games can help shape positive behavior in players. Nonzero sum games that encourage players to cooperate. "Alternate-reality games" can also model real-world problems and encourage players to explore the possible

outcomes of decisions, i.e. discover the ripple effects of a decision, and then they contribute to improve the “game”. Quote: “Multiplayer games are the ultimate happiness engine” (2008 South by Southwest conference keynote speech)

- x. Jane McGonigal: "use everything we know about game design to fix what's wrong with reality" ("Reality if Broken", 2011)
 - xi. Virtual Reality – Jeremy Bailenson (Stanford) <https://comm.stanford.edu/faculty-bailenson/>
- Truth is fundamental. Fight agents who are actively trying to distort the truth (blockchain?). Cyberwarfare will get to the point that we don't even know who the enemy is (eg the CIA may have engineered the attack against Sony and then faked the attack as coming from North Korea)

25. Inner Peace

- Design for emotion
- Model the emotional state of people (using brain waves, body sensors, facial expression recognition with AI)
- Enforce civility in written communications - dialogue monitoring (mood analysis of text, a spelling checker for mood, induction of emotional states)
- Mood-detecting apps and wearables
 - i. Beyond Verbal analyzes voice patterns
 - ii. Emotiv Insight analyzes brainwaves
 - iii. Empatica E4 monitors changes in the skin
 - iv. Muse Headband monitors brainwaves
 - v. PIP measures the skin's electrodermal activity
 - vi. Spire monitors the breathing rate <http://health.usnews.com/health-news/health-wellness/articles/2015/07/09/wearable-technology-can-now-detect-your-emotions>
 - vii. Feel www.myfeel.co reads emotional state
 - viii. A 2017 paper described a wearable AI system by Tuka Alhanai and Mohammad Ghassemi at the MIT can detect a conversation's tone
- Neema Moraveji (Stanford), director of the Calming Technology Lab, thesis on Augmented Self-Regulation <http://moraveji.org>
- Jeff Hancock (Stanford) <https://comm.stanford.edu/faculty-hancock/> using computational linguistics and experiments to understand how the words we use can reveal psychological and social dynamics, such as deception and trust
- Inner peace: Abraham Maslow's hierarchy of needs (1943)
- https://en.wikipedia.org/wiki/Maslow%27s_hierarchy_of_needs#/media/File:MaslowsHierarchyOfNeeds.svg
- Adam Grant's "Give and Take": kindness ripples through society. Happy people make people around them also happier. The viral effects of kindness and its opposite. self-love -> love other people
- A critical mass of "awakening" can cause a phase transition in the entire organization
- Methodologies for communication such as Marshall Rosenberg's nonviolent communication
- Mood: Robert Thayer at California State University in Long Beach ("Self-awareness and self-regulation of mood", 1989): Behavioral scientists have been interested for some

time in the tendency of people to monitor their mood states and to act in such a way as to self-regulate these moods to comfortable levels

- Gordon Bower at Stanford "Mood and Memory" (1981), a tentative computational theory of mood
- The documentary film "Kindness is Contagious" explores these in a great way: <http://kindness-is-contagious.com/> The film highlights work by James Fowler published in the PNAS on "Cooperative behavior cascades in human social networks": <http://www.pnas.org/content/107/12/5334.abstract>
<http://www.pnas.org/content/107/12/5334.full.pdf>
- The research discovered that each act of kindness led to an average of 3 new acts of kindness in a kind of chain reaction explosion of kindness: The results suggest that each additional contribution a subject makes to the public good in the first period is tripled over the course of the experiment by other subjects who are directly or indirectly influenced to contribute more as a consequence. Here's a summary: <http://scienceblogs.com/notrocketscience/2010/03/08/pay-it-forward-cooperative-behaviour-spreads-through-a-group/> This summary: <http://www.sciencedaily.com/releases/2010/03/100308151049.htm> says: The contagious effect in the study was symmetric; uncooperative behavior also spread, but there was nothing to suggest that it spread any more or any less robustly than cooperative behavior, Fowler said. Witnessing acts of kindness and compassion causes a positive physiological shift in the viewer called "moral elevation": http://greatergood.berkeley.edu/article/item/how_our_bodies_react_human_goodness <http://www.ncbi.nlm.nih.gov/pubmed/25813121>
- Check out this great little film that demonstrates the "Kindness Boomerang": <https://www.youtube.com/watch?v=nwAYpLVyeFU>
- Buddhist meta-meditation: peace on me, on you, on them...
- Make the system more humane. QUOTE: Now i am at the airport waiting for my flight to SFO and i was trying to figure out why i feel no motivation to be kind to anyone around me even if everything went well. The problem is the system: the system that took me to the gate where i am now - it exhibits absolutely no kindness. The system is a very efficient but very cold algorithm of waiting for a shuttle that communicates with me only via automated and recorded messages, of checking in at a machine, of dropping the luggage at a carousel where nobody cares for my luggage, of showing my passport to a security agent who doesn't really care whether i'm a terrorist or not as long as i have the appropriate docs to board a plane, of placing my luggage through an xray machine that doesn't care why i carry what i carry (and after obeying stupid rules about no sharp objects - isn't a laptop a very sharp object? - and no drinks), of being overcharged at the airport store for the exact same drink that i was not allowed to bring from home, etc. The system treats us like objects or animals, and sometimes the system is clearly annoyed that we exist at all and don't die sooner. Kindness may have a ripple effect, but i think that the un-kindness (the complete lack of kindness) exhibited by the system towards each individual has the opposite effect of injecting huge doses of anti-kindness vaccine into our immune system. When the system teaches us (every minute of our lives) that it is worth sacrificing kindness for the supreme goal of efficiency why should i sacrifice efficiency for the supreme goal of kindness?
- James Doty, Center for Compassion and Altruism Research <http://ccare.stanford.edu/about/people/ccare-staff/>

D. APPLY PEACE

26. Cities.

- Analysis by David Kilcullen (Washington), counterinsurgency expert
<https://www.newamerica.org/our-people/david-kilcullen> : why most human violence is going to happen in cities. Book: "Out of the Mountains: The Coming Age of the Urban Guerrilla" <https://ieet.org/index.php/IEET2/more/searle20140622> . Counterinsurgency is "armed social science": <http://www.newyorker.com/magazine/2006/12/18/knowning-the-enemy>
- Improving existing positive engagement generates new wealth for the city.
- Po Chi Wu (Hong Kong) "Smart Conversations Smart Citizens" initiative to inspire and motivate entrepreneurs to create a "smarter" city, more responsive to its citizens, so people can be healthier, happier, and more productive
- Persuasive technologies affect a lot of people, with a potential for unintended consequences: test it on several cities before rolling it out globally.
- City as a living organism: Emile Durkheim.
- The city has rich quantitative data.
- Cities are kinds of peace engine.
- The Internet could be a tool for developing communities (sharing economy).
- Current PIL labs:
 - i. Buenos Aires: Juan Manuel Menazzi
 - ii. Denmark: Morten Karnøe Søndergaard
 - iii. Berlin: Anne Kjær Riechert
 - iv. Holland: Ulrich Mans
 - v. Bolivia (Spain): Orla de Díez
 - vi. Tunis: Dorra Mahboui
- In general. Open innovation: innovation is crowd-sourced. Society can't adjust fast enough to speed and scale of technological changes so it is important that they are deployed safely and the best way to let the community control their deployment. People from the community should have not only a voice but also agency.
- Jane Jacobs' The Economy of Cities (1970): what are the main drivers of urban prosperity and growth
- Improbable Corp wants to simulate entire cities. In 2017 Improbable unveiled a project to simulate the town of Cambridge (traffic, public-transport networks, utilities, power lines and mobile-phone and internet systems.
<http://www.wired.co.uk/article/improbable-quest-to-build-the-matrix>
- Cities are always unfinished and incomplete projects
- Work on a local challenge in order to engage citizens who have a vested interest in finding a solution
- City labs need to create sustainable and replicable citizens platforms
- But skeptic about open innovation platforms that don't involve face-to-face interaction: the quality of the conversation and of education tends to be low, and the degree of engagement by the participants tends to be low
- Open IDEO seems to be the only open innovation platform with critical mass

27. What corporations can do: instead of innovation by acquisition, crowdsource product/service innovation design, faster way to deliver design and well-tested design - they can sponsor a

community to do this process, then license the resulting process and embed a lab inside their organization. For example: Increase positive engagement between marketing and product design department - there's a business case per "peace technology" inside their organization - it improves collaboration between individuals, teams, the supply chain

- Intra-corporation communication and collaboration
- Timo Nyberg (Aalto University, Finland): since 2016 applying peace tech inside a corporation <https://people.aalto.fi/new/timo.nyberg>
- Hau Lee on supply chains <https://www.gsb.stanford.edu/faculty-research/faculty/hau-lee>

28. What corporations can do: CRM. Corporations need to learn how to engage customers.
29. What governments can do: allocating some of the defense budget for peace technology, thinking of peace technology as defense technology, to defend in general from violent behavior (internal or external)
30. Gender gap
 - Margarita
 - Londa Schiebinger (Stanford) <https://web.stanford.edu/dept/HPS/schiebinger.html>
Collaboration with the European Union to promote Gendered Innovations in Science, Health & Medicine, Engineering, and Environment
31. Can it be applied to married couples? Increase the chances of a happy marriage?
<https://techcrunch.com/2017/04/21/using-wearable-technology-to-detect-conflict-in-couples-before-it-occurs/>
John and Julie Gottman
32. Science collaboration to promote diplomacy
 - Scientists collaborate across religious, national ethnic and economic boundaries
 - Center for science diplomacy 2010 Tom Wangres
 - Technologies that can help peace: Space exploration! common scientific goal
 - Design is about team interaction, idea exploration, complex challenges
 - Scientists work in a hostile environment
 - Science is nonstop critique
 - Idea generation, team generation, problem solving
 - AAAS Norm Neureiter (Colin Powell's science advisor), main founder of the center for science diplomacy in 2010 with Tom Wangres and others (Rieko willing to make introduction)
 - Renata Fruhter, founding director of the Project Based Learning Laboratory http://pbl.stanford.edu/fruchter_bio.htm Collaboration technologies for multidisciplinary, geographically distributed teamwork
 - Syed Shariq (Stanford), founder in 1997 of Kozmetsky Global Collaboratory kgc.stanford.edu collaborative projects towards creating shareable prosperity
33. 'Institutionalizing' Interdisciplinary Research
 - The National Research Council of the National Academies issued a report with recommendations on how to foster interdisciplinary collaboration in the sciences, looking at Stanford Bio-X as one model for success. <https://www.nap.edu/read/11153/chapter/1>
 - Carla Shatz (Stanford), director of Stanford Bio-X, founded in 1998, bridges the life sciences in the School of Medicine and the Humanities & Sciences with Engineering and Physics <https://biox.stanford.edu/about/people/affiliated-faculty-bio-xclark-center-team-clark-center-faculty-executive-committee-seed>

- National Academies Press (1997): Options for Fostering Interdisciplinary Research and Improving Access to Results <https://www.nap.edu/read/6269/chapter/6>
- Aspen Institute <https://www.aspeninstitutece.org> facilitates interdisciplinary and regional cooperation
- Michael Sims, director of the Mars Rover missions, founding member of the NASA Ames Artificial Intelligence group and field robotics program <https://cinegridbr.org/participantes-participants/michael-sims/>
- Estelle Dodson (NASA), Institute for collaboration and science <http://ieeexplore.ieee.org/document/5928745/>

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Appendix: The Process

