EECE401 Senior Design I

Department of Electrical and Computer Engineering
Howard University

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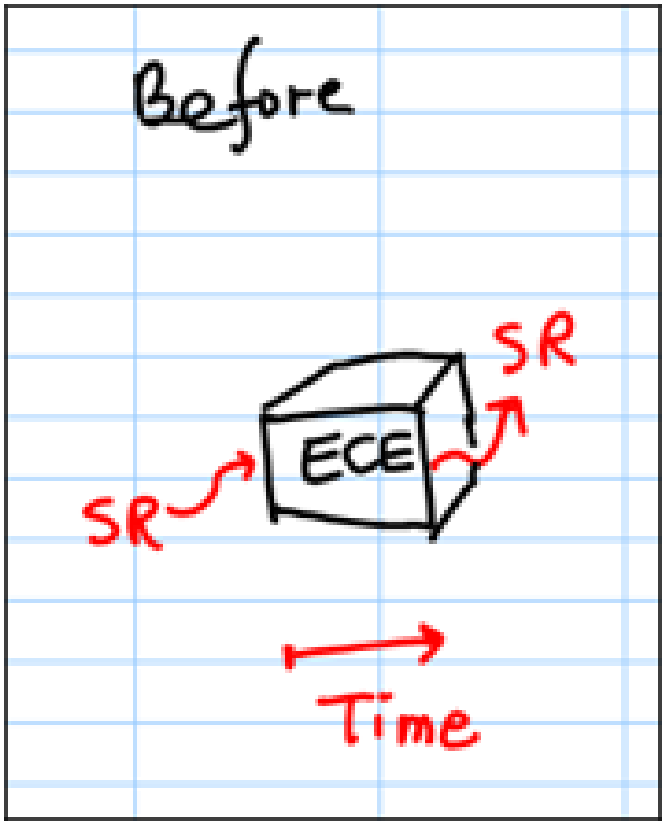
www.MWFTR.com/SD.html

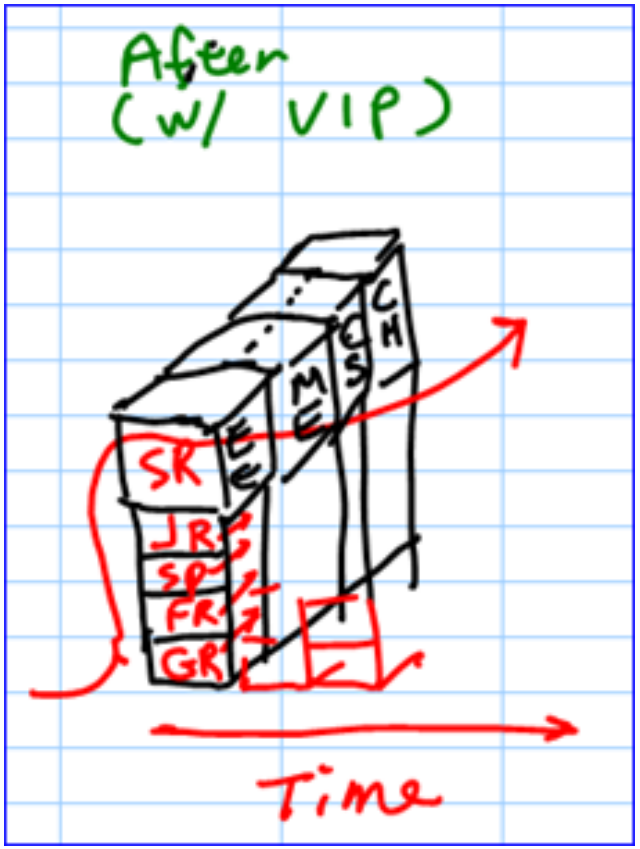
Today's Class

- Announcement
  - VIP (Vertically Integrated Projects) Program
    - Faculty Advisor, graduate students, seniors (leading role), underclass students of different majors an departments, industry sponsor
  - Today's Plan (1 hour)
    - Teamwork and team formation (?) (40 minutes)
    - Solution discussion for the 1st assignment – thinking process (20 minutes)
    - Project description (45 minutes)--- Mr. West and Mr. Windgassen (Northrop Grumman)
      - Interested group discussion (15 – 30 min)

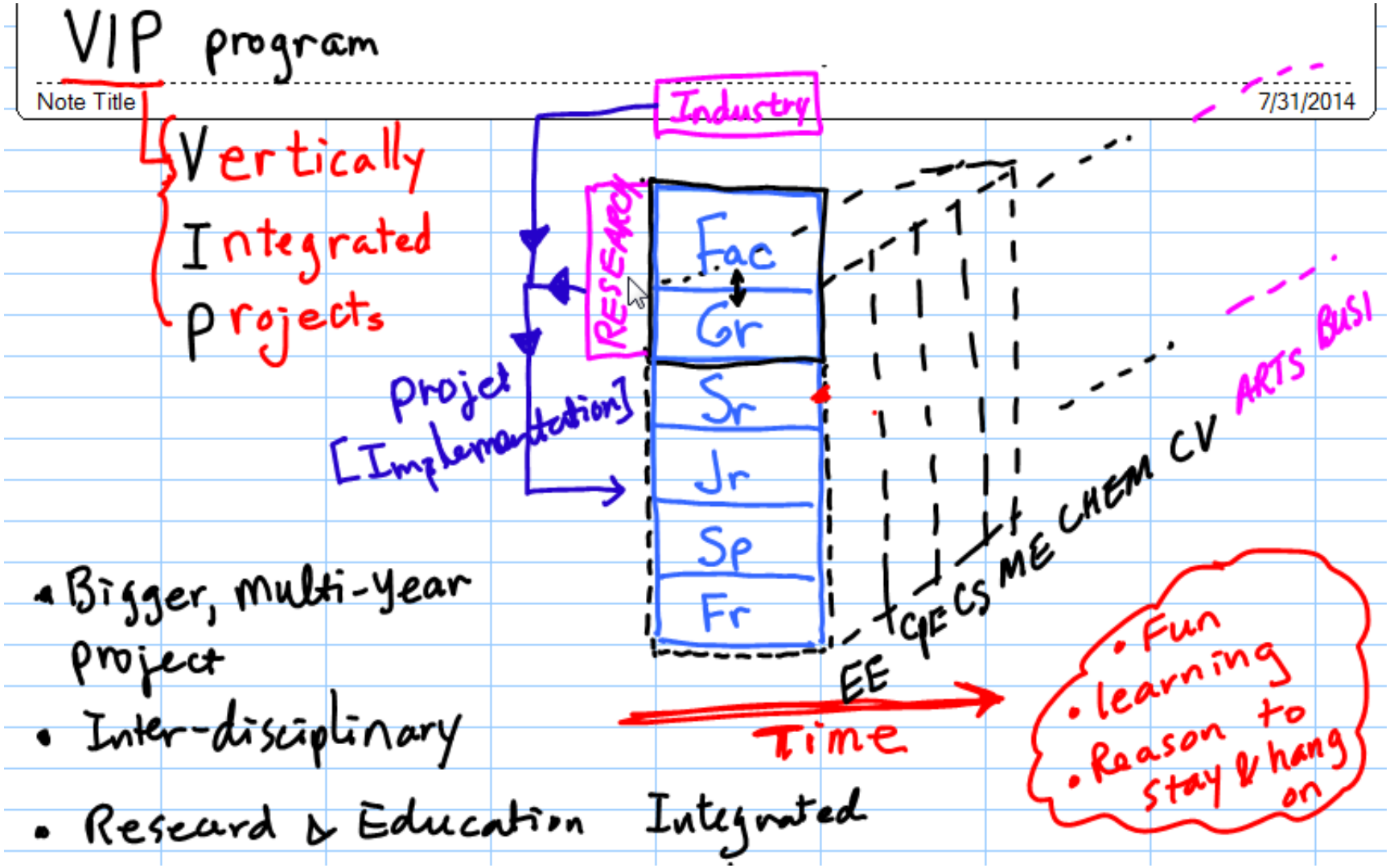
PLAN for Senior Design Class – Before/After

- Senior Design class (with adoption of VIP)



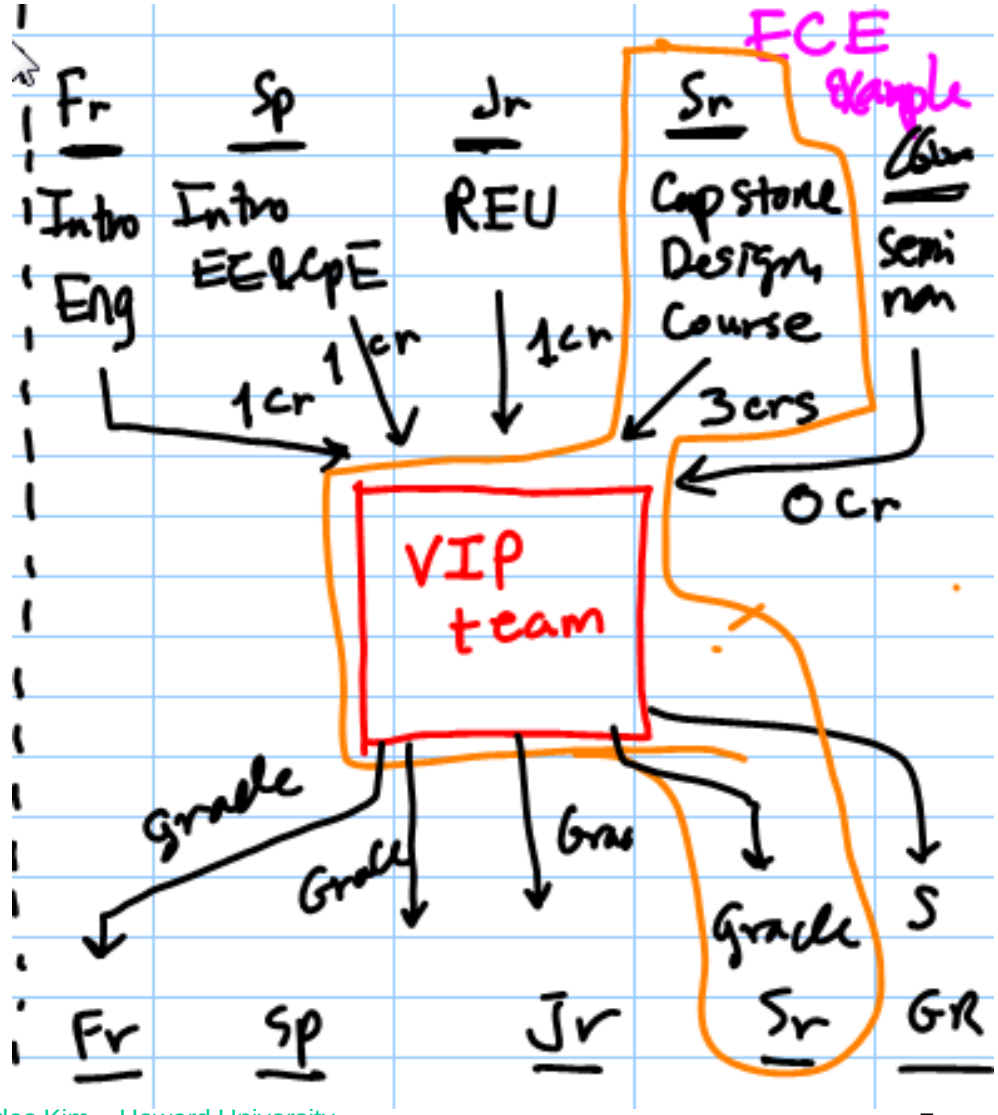


VIP Program - Essence



VIP Program – Credit Structure

- Relevant courses
- Grade/Credit Earning



Teamwork

Groups vs. Teams

- Group
  - Composed of individuals
  - Develops its own codes of behavior and status
- Team
  - A special kind of group
  - Deliberately formed to commit to a purpose
  - "A team is a small number of people with complementary skills who are committed to a common purpose, set of performance goals, and approach for which they hold themselves mutually accountable" --- Katzenbach & Smith
    - Small group
    - Complementary skills
    - Common Purpose
    - Mutual Accountability

More than just tasks

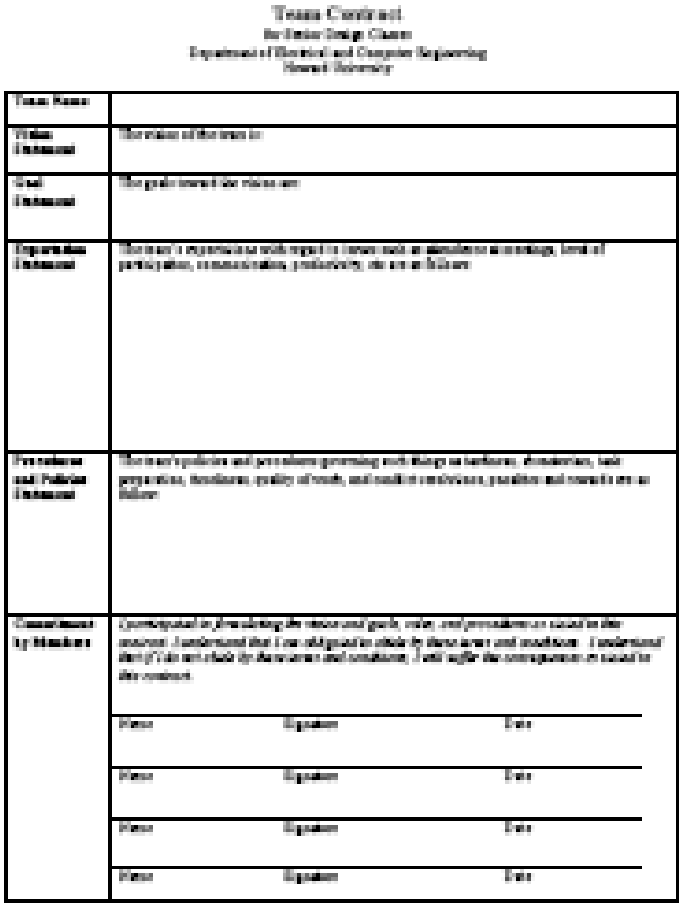
- Effective Team Output:
  - "task productivity" & "relationship morale"
- Tasks:
  - Directed toward reaching goals
  - Focus on problem solving and decision-making
  - Elements of effective task accomplishment
    - Seeking Information
    - Sharing Information
    - Walking the talks
    - Bringing results to meetings
- Relationship:
  - Building Morale through investment in interpersona attributes of motivation, confidence, group dynamics
  - Elements of effective relationship and high team morale
    - Listening
    - Seeking agreement
    - Encouraging
    - Compromising
- Key to Success
  - Balance between Task and Relationship

Team is:

- Team is
  - **Formed** by Relationship among team members
  - **Guided** by a vision and set of common goals
  - **Functioned** by roles of members to accomplish tasks
  - **Run** by following agreed-upon rules and procedures

Team Contract

- Goal
- Expectations
- Rules and Policies
- Commitment



- **We will make team contracts later – after teams are formed**

Team Contract: Goals and Expectations

- Goal Statement
  - Clear, measurable targets that indicates progress toward the purpose
- Expectation Statement
  - Team's expectation on team members in
    - Meeting attendance and on-time arrival
    - Activity participation
    - Communication
    - Productivity
    - Assigned task completion
    - Keep the deadline
    - Etc

Team Contract: Rules and Policies

- Rules and Policies
  - Ground rule for common area
  - Running of Meetings
    - Who runs the meeting?
    - Cell-phone policy
    - How team decisions and consensus will be reached
  - How meeting absenteeism and tardiness will be handled
    - Policies for missing one meeting or being late
    - Policies for contacting someone to contact
  - Expectations of quality works
    - How to handle late and incomplete work of a member?
    - How to reward team members who exceed expected performance
  - Relationship
    - What each member to bring to each meeting
    - Developing “can do” attitude
    - etc

Running Effective Meetings

- Meeting
  - The main form of information exchange
  - Tasks to be identified and allocated
  - Status on assigned tasks reported
- Meeting Agendas and Minutes
  - Without agenda, meeting is not productive
  - Agenda contents:
    - Purpose
    - Topics
    - Desired outcomes
  - Meeting Minutes

Meeting Etiquette

- Begin the meeting on time
- Review the agenda as the first activity of the meeting
- Focus discussion on facts (not on personal issues)
- Stay on track
- Close the meeting effectively
  - Summarize the decisions made and action items for each member
  - Set the agenda for next meeting
  - Evaluate how the meeting went

Busting a Meeting

- Schedule a meeting via voice mail, answering machine message, or similar way of “no guarantee” of reception or confirmation.
- Making last minute changes to meeting time
- Wait for everyone to arrive before starting
- Get sidetracked early on an unimportant issues
- End a meeting without reviewing what everyone is supposed to do before the next meeting

Signs of Trouble

- The meetings are formal, stuffy, or tense.
- There is a great deal of participation but little accomplishment.
- Disagreements are aired in private conversations.
- Decisions tend to be made by the formal leader with little meaningful involvement of other team members.
- Members are not open with each other because trust is low.
- There is confusion or disagreement about roles or work assignments.
- People in other parts of the assignment who are critical to the success of the team are not cooperating.

Characteristics of Effective Teams

- Loyalty
- Commitment
- Sense of belonging and desire to stick together
- Honest communication
- Mutually respectful and friendly environment
- Enthusiasm
- Willingness to take responsibility
- Tolerance of individual difference (weakness)
- Appropriate recognition of good work

Peer Evaluation – Rationale

- **Teamwork & Fairness**
- Evaluation of each team member's strength and weakness in terms of Tasks and Relationships
- Each member fill out the form individually
- Submit the form individually via email (when required)
- The submitted evaluation forms and results are kept confidentially by the instructor.
- But will be used in grading

Peer Evaluation

- For each item (we have 10 items) a team is given a sum of money allocated to $500 per member.
- For each item, distribute the sum to each member according to his/her performance on the item
- The same scores for all members are not accepted nor counted.
- P = [Total Amount of Money]/5000

Peer Evaluation

		Write each member's LAST name below (including yours)				
1	Works cooperatively to complete team assignments					
2	Prepares for, arrives on time, and attends meetings					
3	Makes positive contributions to meetings					
4	Work is of high quality and completed on time					
5	Brings a creative spark to the team					
6	Supports and respects other members' efforts and opinions					
7	Is able to give and receive feedback effectively					
8	Is responsible and accessible					
9	Is enthusiastic about the project and energetic					
10	Demonstrates effective leadership, keeps team focused, and elevates the work of the entire team					
	TOTAL					

By the way; Project Team Binder

- Record/Keep all your works
  - Individual works, drafts, emails,
  - Datasheets, ordering receipts, etc
  - Proposals (v1, v2, …vn)
  - Meeting Minutes
  - Presentation
  - Design Requirements
  - Anything and everything the team did and produced
- Put them in to a Binder – chronological order
- Submit the binder
  - End of Fall 2014 Semester
  - End of Spring 2015 Semester
- **Reminder !!!!**
  - **Individual project note**

Project Team 1

- Niobium Underwater Electrical Connector (Industry sponsor: Northrop Grumman)
  - Charles Kim (Fac Advisor)
  - Trey Morris (GR, ECE)
  - Mpho Musenga (GR, ECE)
  - ???
  - ???
  - ???
  - ???
  - EGGP (ME)
  - EGGP (CV)
  - EGGP (EE)
  - Jim Windgassen (NGC Advisor)
  - Gregory West (NGC Advisor)

Possible Teams 1– Next Wed Presentation

- Cryptographic FPGA against Hardware Trojan (**Dr, Hassan Salmani**)
- Text to ASL (**Sarad Dhungel)**

Possible Teams 2– Next Wed Presentation

- Busboy Robot III (formerly sponsored by IEEE Student Chapter & HKN) (**Dhuel Fisher**)
- Electro-Sonic Wave Master for Moogfest Circuit Bending Challenge (**Michael Robinson**)

Thinking Process of Assignment #1

- Which circuit is inside the box?
- Thinking Process

Assignment #1: Two circuits I and II shown below in Fig.1 are equivalent. Circuit I, which comprises of a source with a series resistance, is called a Thevenin circuit while Circuit II is called a Norton equivalent circuit to the Thevenin, with a current source of which size is determined by the amount of the voltage in I divided by the resistance in I, and a parallel resistor with the same resistance as in I. Now, a technician built a circuit (I or II) with an actual source and an actual resistor, and put the circuit inside a metal box, and made out the two terminals A and B as in either of the circuits. The problem is how to find which circuit is built and placed inside the box? Think over the problem and provide your solution approach in a typed report, and be ready for a class discussion. **Hardcopy report submission due: 2:00pm 09/10/2014**

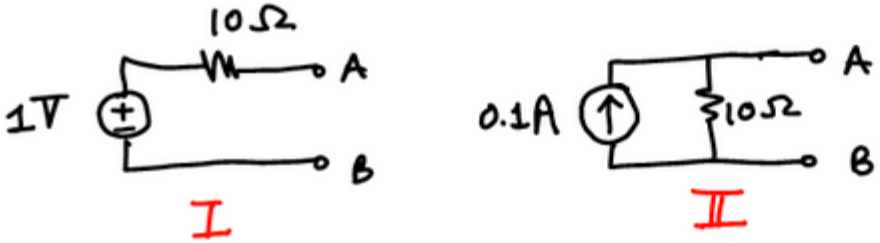
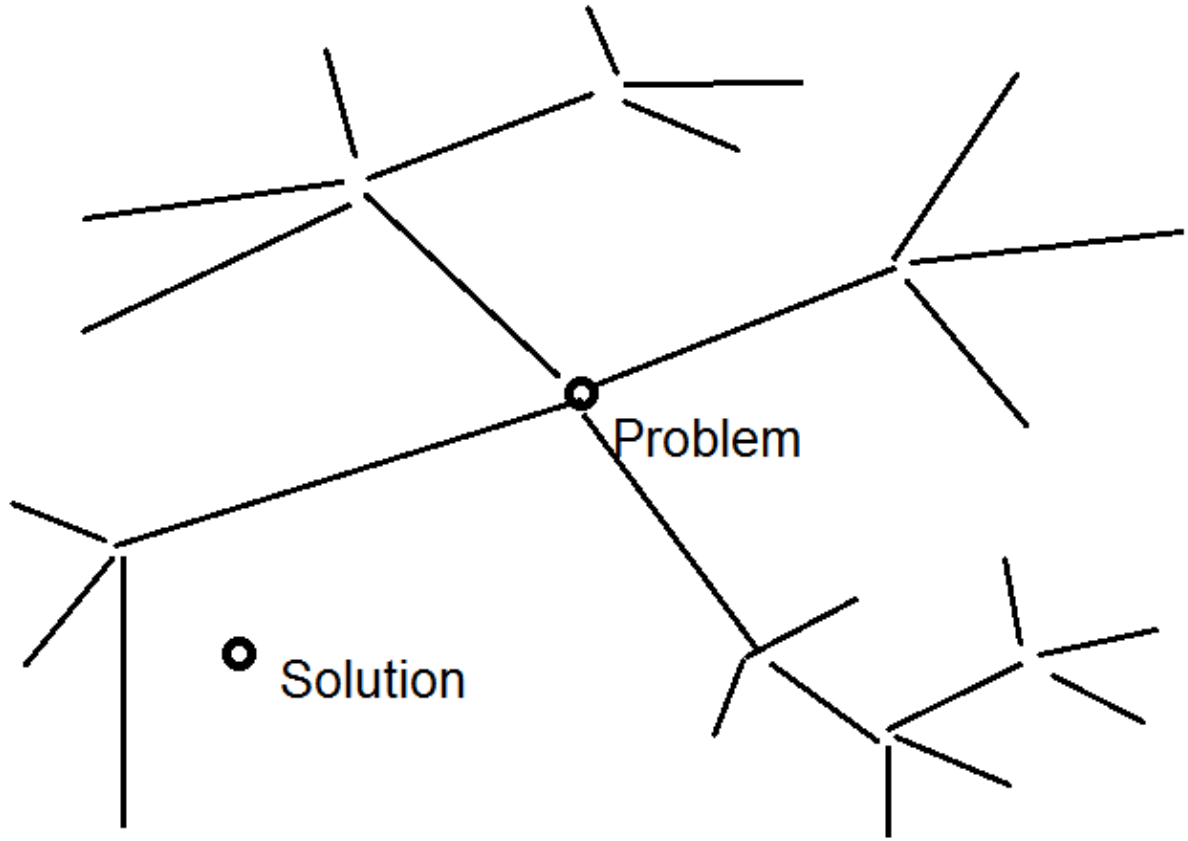


Fig. 1

Thinking Process of Assignment #1

- Which circuit is inside the box?
- Thinking Process



Problem Solving with TRIZ

- Intuition
- Random and trail-and-error
- Initial tendency and Inertia Vector
- Is there “Technology of creativity”?
- TRIZ (*Teoriya Resheniya Izobreatatelskikh Zadatch*)
  - Theory of Inventive Problem solving
  - Algorithmic approach
  - By Genrich Altshuller

ТРИЗ

How Ideation/TRIZ Works

When it failed

Try TRIZ