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23.	SMART CALIPH GAME BOARD	25
24.	KEBERKESANAN EQ-MAZE DALAM MENINGKATKAN MINAT DAN PENCAPAIAN PELAJAR	26
25.	INACLE SYSTEM (INFORMATION ACCIDENT VEHICLE SYSTEM)	27
26.	PENGGUNAAN SISTEM ‘FLIPPED CLASSROOM’ BERSAMA DENGAN APLIKASI WHATSAPP DAPAT MENINGKATKAN MASA INTERAKSI PDPC	28
27.	IMMERSIVE LEARNING EXPERIENCE ON PORTFOLIO DESIGN THROUGH MASSIVE OPEN ONLINE COURSE (MOOC)	29
28.	KEBERKESANAN ALAT BANTU MENGAJAR “PERFORM VISUAL INSPECTION ON WELDED JOINT” DALAM PENGAJARAN DAN PEMBELAJARAN TEKNOLOGI KIMPALAN.	30
29.	PENGGUNAAN TRACKER DALAM PEMBELAJARAN MAKMAL FIZIK	31
30.	KEBERKESANAN APLIKASI MIKRO KOMPUTER DALAM EKSPERIMEN KAPASITOR	32
31.	EZEVENT	33
32.	SEALAB – COCOA HAND BUTTER	34
33.	SMILE: INNOVATIVE FACIAL MIST	35
34.	SNAPNUTRITION AS EDUCATION AND NUTRITION IMPROVEMENT FOR INDONESIAN PEOPLE THROUGH MACHINE LEARNING TECHNOLOGY	36
35.	DiOjekin! : MOBILE APPS OJEK ONLINE SYSTEM FOR DISABILITIES	37
36.	APATHETIC APPS – MOBILE APPLICATION DEVELOPMENT TO LOCK SMARTPHONES AND UNLOCK IT BY USER’S CONVERSATION	38
37.	CHEM-AR	39
38.	EDUCATIONAL ANDROID SIMULATOR OF RES-CIRCUIT QUIZ BOARD	40
39.	GAS LOAD MONITORING SYSTEM BASED ON IOT TECHNOLOGY	41
40.	BELOVED TRACKER SYSTEM	42
41.	RH-SILICA	43
42.	SMART TYRE	44
43.	SMART TRAFFIC SIGN GAMES: INNOVATION TECHNOLOGY BASED ON INTERACTIVE SURFACE AND AUGMENTED REALITY FOR EARLY CHILDHOOD	45
44.	ETRACE	46
45.	RAT DISSECTING KIT	47
46.	TOURGO - GAMIFIED AUGMENTED REALITY TOUR	48
47.	IMPLIMENTATION OF SANATORI FOR DETECTOR OF CORAL REEF DESTRUCTION BASED ON ULTRASONIC	49
48.	SENSOR ENHANCED REHABILITATION FOR KNEE INJURIES	50
49.	EDUCATIONAL ANDROID SIMULATOR OF RES-CIRCUIT QUIZ BOARD	51
50.	MELYNA: INNOVATIVE FACIAL SERUM	52
51.	K-TRAC GADGET	53
52.	JUBELITAS (JUAL BELI KARYA DISABILITAS)	54
53.	THE EFFECTIVENESS OF USING CIRCLE GEOMETRY BOARD (CG-BOARD) STRATEGY IN LEARNING CIRCLE GEOMETRY TOWARDS SECONDARY STUDENTS PERFORMANCE	55
54.	UTILIZING THE CIPLUKAN PLANT AS A YOGURT AND HERBAL REMEDY WITH A MYRIAD OF BENEFITS	56

INNOVATION

CATEGORY

SENSOR ENHANCED REHABILITATION FOR KNEE INJURIES

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Problem Statement

Knee injuries or knee pathologies are common among normal population and athletes and were frequently presented in general clinical practice. Muscle activity and muscle strength is important in knee rehabilitation and the physiotherapist's understanding of how and what muscles move during various activities and exercises can enhance them to apply different strength training procedures, specific group muscle protocols and choose more efficient and secure methods for exercising which helps in injury rehabilitation.

At present muscle monitoring during rehabilitation is largely restricted to laboratory setup and not feasible for long term monitoring under real life conditions and existing approaches such as EMG, require bulky hardware or special attachment of leaded electrodes to the skin , making wide spread placement difficult. In the Physiotherapy clinical setting, it is difficult to evaluate muscle participation when a patient is performing dynamic functional activities for precise muscle group strength protocol for better and faster recovery, Physiotherapists' conventional clinical assessments are usually subjective and involve clinician or patient-rated scales for conclusive physiotherapy protocol.

Idea/ Propose solution

In recent few years, the technology had grown vastly and muscle sensors are introduced. Muscle sensors are able to function like a mini storage device and the muscle activity sensed can be stored in it, which can then be intergraded into readable format.

Through this study, our aim is to establish a portable sensor based motion capture system during a variety of clinical functional tasks and custom written program that processes sensor data and generates user friendly clinical movement muscle analysis. In certain injuries, the activities of certain group of muscles will be diminished and by measuring the muscle activities, the affected muscle group will be detected. The therapist can then plan out a better strengthening protocol for the affected group of muscles.



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